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Exploring Food Purchase Behavior of Low-Income Households

How Do They Economize?

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Abstract

This report compares food purchases by U.S. households of different income levels and finds that low-income shoppers spend less on food purchases despite some evidence that they face generally higher purchase prices. Households can economize on food spending by purchasing more discounted products, favoring private-label (generic) products over brand, pursuing volume discounts, or settling for a less expensive product (for example, less lean beef) within a product class. A 1998 sample of foodstore purchase data shows that low-income households adhere to these practices when possible, but that the typically smaller size of foodstores in urban and rural locations may sometimes preclude them from doing so.

Keywords: Food spending, low-income households, cereal, meat, poultry, cheese, fruit, vegetables, discounts, promotions, scanner data.

Introduction

Walking down the aisles of a supermarket, low-income shoppers must consider a number of factors including quantity, price, quality, and nutritional differences when selecting food products. Food purchase decisions by the poor often entail tradeoffs among taste, preference, and quality factors—either real or perceived—to meet spending constraints. Within broad product categories such as cereal, cheese, meat and poultry, and fruits and vegetables, shoppers can choose among many substitutable products. This Current Issues investigates the food purchase behavior of lowincome households, contrasting it with that of higher income households, in order to get a better understanding of the economizing practices of the poor.

Low-income shoppers can stretch their food dollars in a number of ways: they may shop in discount foodstores; they may purchase and consume less food than higher income shoppers; they may purchase low-priced (and possibly lower quality) food products; or they may rely on some combination of all three. A better understanding of how the poor economize in food spending addresses important policy questions raised by researchers, nutrition educators, and food assistance program managers. Understanding food choices of the poor, for example, is critical to the success of policies that provide educational material on consequences of alternative dietary intakes.

Whether the poor face significantly different food prices due to where they shop for food remains an unresolved empirical question.¹ Extensive research has accumulated over the years trying to answer the question: "Do the poor pay more for food?" The Economic Research Service (ERS) in 1997 reviewed the results of studies comparing price differences in grocery stores across different income levels and combined these with current census data on the distribution of low-income households by urbanization type. The ERS study concluded that, in general, the poor face higher prices due to their greater representation in urban and rural loca-

¹For example, Hayes (2000) found that prices were up to 6 percent lower in poor neighborhoods. Frankel and Gould (2001) found that low-income households faced higher prices, but that the prices they face depend on their proximity to low- and middle-income neighborhoods.

tions (as opposed to suburban locations), where food prices tend to be higher.

Based on results from household surveys, ERS also found that despite facing higher prices, low-income shoppers spend less than higher income shoppers for food purchased in foodstores. Due to their level of aggregation and lack of instore sales and promotion information, such surveys cannot shed much light on the economizing practices of households. To learn more about how low-income shoppers spend less for food despite facing higher prices, we obtained foodstore purchase data that incorporate per-capita quantity and expenditure measure equivalents (household measures adjusted for household size) across income levels. The resulting comparisons describe how individuals with different levels of income vary in their food-spending patterns. By using actual transaction data, we obtained detailed information about the product purchased (for example, price, product description, package size, and brand name) as well as the condition of purchase (promotion, coupon, or sale item) (see box "Household Scanner Data Provide New Insights"). From these, we calculated the average unit cost (per ounce, per pound) for each item.

We investigated possible explanations for food spending differences across income levels using household food purchase data for selected food categories (table 1) from October 1997 to October 1998 (fiscal year 1998) for a nationally representative sample of households (see box, "Data Description"). By comparing household behavior across income groups, we determined: (a) how total spending differs for a specific food item, type, and category, and (b) how income groups differ in the economizing practices that they utilize.

Economizing Practices

Low-income shoppers may use four primary economizing practices to reduce their food spending. First, they may purchase a greater proportion of discounted

products. Second, they may purchase more private-label products (generic or store band) versus brand products than higher income shoppers. Third, they may take advantage of volume discounts by purchasing larger package sizes. Fourth, they may purchase a less expensive food product within a product class. Although quality differences such as freshness, convenience, and taste often contribute to price differences, differences in nutritional quality such as fat content are also evident.²

Table 1—Summary of ACNielsen Homescan data, 1998

Category	Types	Brands	Items	Observations	
	Number				
Fixed-weight:					
RTE cereal ¹	61	7	183	732	
Packaged cheese	14	20	59	236	
Random-weight:					
Meat	4	Not applicable	71	213	
Poultry	3	Not applicable	34	102	
Fruits	31	Not applicable	31	93	
Vegetables	29	Not applicable	29	87	
Cheese	24	Not applicable	24	72	

¹RTE is ready-to-eat.

Household Scanner Data Provide New Insights

In the recent past, food expenditure data were collected from household surveys. Because either diary or recall methods were used, the amount of detail available to researchers was limited to fairly aggregated food categories. Product characteristics, including item price and package size, were typically not collected. Instead, respondents were asked to provide combined spending and quantities for all food items within a specified category, such as vegetable juice or natural cheese.

With the advent of supermarket checkout scanner systems in the 1970s, detailed sales data began to be collected for the first time. Little information, however, was known about the characteristics of shoppers responsible for food purchases. To learn more about their customers, retailers initiated loyalty cards that offered discounted prices with their use while allowing retailers to track detailed purchases of their customers over time. Although detailed sales and purchase data were now available, little information about the characteristics of shoppers purchas-

ing food was still known. Retailers wanted to learn more about their shoppers to cultivate their loyalty.

The introduction of hand-held, portable scanning devices allowed for the collection of detailed item purchase and household demographics data for the first time. Syndicated thirdparty data companies formed consumer panels selected to represent demographic groups. These panel members provided information about household size, education, and annual income, as well as detailed item purchases using a home-based scanning device. An additional benefit of home-based scanning is the inclusion of non-barcoded items. Many random-weight foods, such as produce and fresh meat, were not included with retail sales data because they lacked universal product code labels. The consumer panels are given pre-printed item descriptors and corresponding bar codes that are scanned and subsequently compiled by the data collection firm. The availability of detailed purchases combined with household characteristics offers researchers new opportunities for studying consumer behavior and provides greater insight to retailers about their consumers.

²Many random-weight and private-label product categories such as fresh meat, produce, and cheese offer a range of item prices due to actual or perceived quality differences. For a discussion of quality factors, see Kaufman et al. (1997), p. 16.

The use of promotions is measured by comparing the percentage of expenditures and quantities of each product purchased on promotion (manufacturers' coupons, store coupons, store sales, and other promotions). Table 2 shows the proportion of expenditures and quantities of selected product classes purchased on promotion, by income level. For random-weight cheese, fruit, vegetables, and meat in 1998, low-income households (less than \$25,000 income per year) spent a greater share of expenditures for

products on promotion than other households. (This also is true for quantities purchased on promotion.) For poultry, however, middle-income households spent about the same percentage on promotion as low-income households (36 versus 35 percent, respectively),³ but for both groups, spending for promotion items was at least 5 percentage points more than spending by the high-income group.

Among fixed-weight products, promotion spending patterns differed. Lowincome shoppers purchased the lowest share of total RTE (ready-to-eat) cereal on promotion. This result may be explained by other economizing practices in this product category—such as purchasing a larger percentage of private-label products (fig. 1), which are on promotion less often but have lower nonsale prices than the brand name alternatives. We found a similar but less extreme result for packaged cheese, so

Data Description

The Nielsen homescan data set is a collection of food expenditure (in dollars) and quantity (in pounds and ounces) measures for a 40,000-household sample of consumers that is representative of the U.S. population based on measures from the 1990 census. The expenditure and quantity data are measured per product type (for example, Cheerios, apples, and natural cheddar cheese) for each income group as well as for all households combined. This data set records all food-at-home purchases made by all individuals in each household through a scanning device in each home that the household members use to record codes for all purchased products. This report focuses on two fixed-weight food product categories (ready-to-eat (RTE) cereal and packaged cheese) and five random-weight product categories (cheese, meat, poultry, fruit, and vegetables) from the sample for October 1997 to October 1998 (fiscal year 1998).^a

Table 1 describes the depth of detail available in the data. The first column (Types) details the specific number of subgroups within each category (for example, turkey, duck, and chicken within the poultry category), and the item count refers to the number of types disaggregated by the varieties of each type (ground, thigh, and breast) in the data. The number of observations refers to the number of data entries, that is, the number of items disaggregated by income subgroup. For the fixed-weight product categories of the data, the households are divided into four income groups (< \$25,000, \$25,000-\$34,999, \$35,000-\$49,999, and \$50,000+); for the random-weight products, households are divided into three income groups (< \$35,000, \$35,000-\$49,999, and \$50,000+). The random-weight products data set comes from a 12,000-household subsample of the 40,000 households in the initial survey. This smaller set of households is not large enough for Nielsen to have created a statistically valid cell for each product type for the four income levels used in the full data set. Therefore, only three income levels are used with this part of the data.

In addition to the total expenditure and quantity measures for each observation, the data set also contains information on the type of promotion, if any, at the time of purchase. For the RTE cereal and packaged cheese products (fixed-weight), the types of promotions included manufacturer coupons, store coupons, store sales, and other promotions, while the random-weight products included store sales and other promotions as promotional categories. All of these measures are also calculated per person, according to the average number of people per household for each income level.^b For the RTE cereal and packaged cheese products, the measures of expenditure and quantities purchased are also broken down by package size^c of the product and by brand type (branded, store/private-label brand, and generic). Finally, each product's penetration rate—percentage of the sample that purchased the product—is reported for all products in the data.

One unique aspect of these data, in contrast with many other scanner data sets, is that the data collection occurs at the household level rather than the store level. This allows one to look at a consumer's food purchase decision from all foodstore types and locations available to households. The expenditure and purchase data, therefore, account for the store choice made by each consumer in each household. The information on promotion type, package size, and brand type allow one to investigate differences in purchasing patterns across the different income levels. Within the random-weight products, one can look at apparent quality tradeoffs made by the differences in purchase choices among households with different income levels.

Footnotes

^aFixed-weight products are defined as those products that are packaged such that each package has the same weight (for example, a 16-ounce box of cereal), while random-weight products are those products that vary in weight per individual package (for example, fresh meat).

^bFor the fixed-weight products, the average number of people per household increases with average income from 2.09 people per household in low-income households to 3.00 people per household in high-income households. For random-weight products, low-income households have 2.28 people per household, and high-income households have 3.02 people per household.

^cFor each type of cereal and cheese in the data, product packages were compared to designate a small, medium, and large package for each product.



³But not significantly different from each other at the 5-percent level.

low-income shoppers may again be economizing in other ways.⁴

Results relevant to the second possible way to economize—purchasing more

private-label products—are presented in figures 1 and 2. Low-income households spent 11.5 percent of their RTE cereal expenditures on private-label cereals, while the higher income households spent lower shares decreasing with increasing income levels. A similar pattern is found for the quantities of private-label RTE cereal purchased.⁵ Figure 2

shows a similar pattern, but with smaller differences, for purchases of packaged cheese products. Low-income households (less than \$25,000 annual income) spent 11.6 percent of their packaged cheese product expenditures on privatelabel products, compared with 10.9 and 10.5 percent for the middle-income households and 9.6 percent for the high-income group. Again, the pattern was similar for the quantities purchased. These measures indicate that low-income shoppers economize in buying fixed-

Table 2—Percent of expenditure and quantity purchased on promotion by income level, 1998

Product/	Expenditure	Quantity
Income level	per person Percent	per person
Fixed weight:	Percent	
RTE cereal— ¹		
	20	20
< \$25,000 \$25,000 \$24,000	33 38	38 43
\$25,000-\$34,999	38	43
\$35,000-\$49,999	36	43 42
\$50,000+	30	42
Packaged cheese—		
< \$25,000	24	27
\$25,000-\$34,999	25	28
\$35,000-\$49,999	26	29
\$50,000+	24	27
400,000		
Random-weight:		
Cheese—		
< \$35,000	13	15
\$35,000-\$49,999	10	12
\$50,000+	12	13
Meat—		
< \$35,000	32	38
\$35,000-\$49,999	32	38
\$50,000+	27	34
ψ50,0001	21	04
Poultry—		
< \$35,000	35	43
\$35,000-\$49,999	36	43
\$50,000+	30	38
Vegetables—	40	0.4
< \$35,000	19	24
\$35,000-\$49,999	17	21
\$50,000+	15	18
Fruit—		
< \$35,000	26	30
\$35,000-\$49,999	25	29
\$50,000+	21	25

Figure 1
Expenditure and quantity shares for store brand
RTE cereal (per capita) by income level, 1998

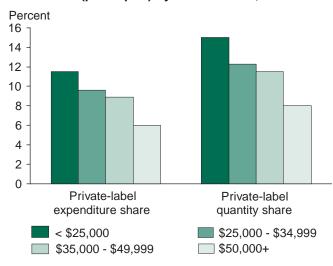
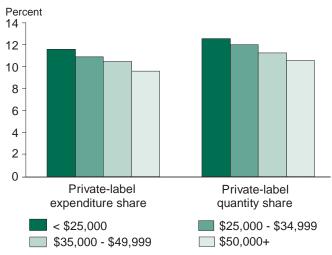


Figure 2
Expenditure and quantity shares for store brand packaged cheese (per capita) by income level, 1998



⁴One factor that cannot be fully accounted for in the analysis is the role of the WIC (Women, Infants, and Children) food assistance program. Both cereal and cheese are included in the WIC food package. Many cereal types and certain cheese items are excluded from authorization, due to both Federal- and State-imposed restrictions, thereby excluding potential purchases under promotion.

⁵15.0 percent for low-income households, 12.3 and 11.5 percent for the two middle-income household groups, and 8.0 percent for the high-income group.

⁶12.6 percent for low-income households, 12.0 and 11.3 percent for the two middleincome household groups, and 10.6 percent for the high-income group.

Figure 5

Percent

Figure 3
Expenditure shares for RTE cereal by package size and income level, 1998

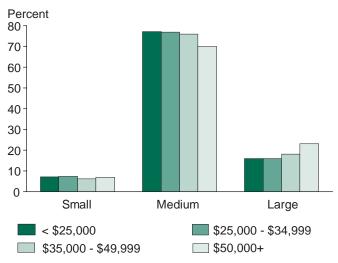
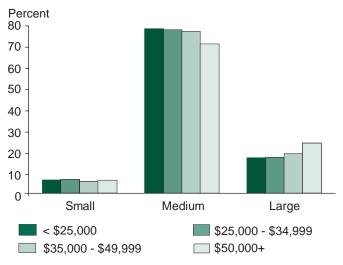


Figure 4
Quantity shares for RTE cereal by package size and income level, 1998



weight cheese and RTE cereal by favoring private-label products.

Choice of package size also enables those in low-income households to economize by purchasing larger packages, which often have lower per-unit prices than smaller packages. However, figures 3 and 4 show that low-income households' purchases of large packages of RTE cereal were less than such purchases by other households in 1998. In 1998, households earning \$50,000 or more spent 23.1 percent of cereal pur-

60 - 50 - 40 - 30 - 20 - 10 - 0

Medium

Large

\$25,000 - \$34,999

\$50.000+

Expenditure shares for packaged cheese by

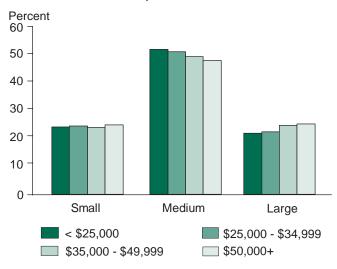
package size and income level, 1998

Small

< \$25,000

\$35,000 - \$49,999

Figure 6
Quantity shares for packaged cheese by package size and income level, 1998



chases on large packages, compared with 15.8 percent by the low-income group (figs. 3 and 4). A similar pattern was found for fixed-weight cheese products (figs. 5 and 6). In fact, low-income households had the lowest proportion of large-package purchases of all income groups. This behavior has three possible explanations: (1) transportation constraints—low-income shoppers do not have access⁸ to stores that sell large packages, (2) budget constraints—they cannot afford to "stock up" on staple products, and (3) storage constraints—they perceive that the cost of storing

large packages is higher than the savings from the volume discount. A combination of these constraints likely accounts for much of the observed difference in package size quantities purchased and expenditures on those packages by the different income groups.

In addition to economizing strategies based on buying larger packages, private labels, and promotional items, low-income shoppers may also substitute lower priced items (for example, lower grade cuts of meat) within a product type. Using the quantity and expenditure

⁹This is especially true for refrigerated and frozen foods.



⁷For example, in RTE cereal, the average price per ounce for products in the sample is \$0.18 for small packages, \$0.16 for medium packages, and \$0.15 for large packages.

⁸Or at least less access than higher income households.

data for specific product types within the random-weight product categories of meat, poultry, fruits, and vegetables, we compared the choices made by shoppers in the different income groups.¹⁰

Low-income households, on a per-capita basis, purchased 7.6 percent more meat and poultry (combined) than middleincome households and 6.7 percent more than high-income households (table 3).¹¹ The combined difference is mostly from the difference in quantities of meat that low-income households purchased. These differences show that middleincome households substituted some meat purchases with poultry purchases. Low-income households purchased more meat but spent less per pound for both meat and poultry. Comparing average prices per pound, low-income households paid 6.2 percent less for meat and 5.5 percent less for the poultry than did middle-income households (table 3). Those findings suggest that the poor may keep their food spending down, in part, by purchasing lower quality products.

Low-income shoppers may also be economizing by purchasing a less costly combination of fruit and vegetable product types. Low-income households paid 11.5 percent less, on average, per pound for vegetables than high-income households and 9.6 percent less, on average, per pound for fruit (table 3). This price measurement is a function of the quantity and expenditures that each household

type devotes to fruits and vegetables. Overall, low-income households purchased 3.3 percent less fruits and vegetables (by weight) per person than high-income households, but they paid 13 percent less. This implies that these

households are choosing less expensive fruits and vegetables. For example, lowincome households purchased 4 percent more bananas, a relatively inexpensive fruit, than high-income households, who

Table 3—Total expenditure, quantity, and price by income level (ACNielsen aggregate values), 1998

Product/income level	Expenditure	Quantity	Price
	per person	per person	per pound ¹
	Dollars	Pounds	Dollars
RTE cereal:2			
Total	25.40	10.68	2.38
< \$25,000	25.47	10.97	2.32
\$25,000 - \$34,999	25.03	10.71	2.34
\$35,000 - \$49,999	25.26	10.76	2.35
\$50,000+	25.57	10.38	2.46
Packaged cheese:			
Total	23.62	7.79	3.03
< \$25,000	23.93	8.15	2.94
\$25,000 - \$34,999	22.43	7.51	2.99
\$35,000 - \$49,999	23.58	7.88	2.99
\$50,000+	23.91	7.58	3.15
RW cheese:3			
Total	7.80	2.32	3.36
< \$35,000	7.23	2.20	3.29
\$35,000 - \$49,999	7.47	2.10	3.57
\$50,000+	8.69	2.60	3.35
+ ,			
RW meat:3			
Total	82.46	46.31	1.78
< \$35,000	81.04	48.70	1.66
\$35,000 - \$49,999	78.81	44.55	1.77
\$50,000+	86.19	44.29	1.95
RW poultry: ³			
Total	19.57	15.13	1.29
< \$35,000	18.04	15.06	1.20
\$35,000 - \$49,999	18.73	14.71	1.27
\$50,000+	21.93	15.44	1.42
RW fruit: ³			
Total	28.73	41.45	0.69
< \$35,000	26.90	40.88	0.66
\$35,000 - \$49,999	27.44	39.25	0.70
\$50,000+	31.70	43.33	0.73
, , , , , , , , , , , , , , , , , , , ,			
RW vegetables:3			
Total	20.47	25.02	0.82
< \$35,000	20.06	25.90	0.77
\$35,000 - \$49,999	17.96	21.72	0.83
\$50,000+	22.31	25.70	0.87

¹Price per pound is imputed from the quantity and expenditure data.

³RW is random-weight.



¹⁰Although among fixed-weight packaged foods, private-label items typically are lower priced relative to brand products, many consumers may not perceive significant quality differences. Because advertised brand products are not prevalent among random-weight categories, price differences are more likely to reflect quality differences.

¹¹This difference may also be explained by the increased away-from-home food expenditures of higher income households. They may, in fact, be consuming equal amounts of meat and poultry, with a larger share of away-from-home food consumption than low-income households. However, the quality of meat purchased is usually lower for low-income households. Low-income households purchased 9.3 percent more meat per person than middle-income households and 10 percent more meat per person than high-income households.

²RTE is ready-to-eat.

purchased 18 percent more berries, a relatively expensive fruit. 12

Conclusion

Comparisons across income groups found evidence that the poor economize on their food purchases to limit spending. They accomplish this by purchasing random-weight products on sale, purchasing a greater proportion of privatelabel (fixed-weight) products, and purchasing less expensive meats, fruits, and vegetables. By selecting less expensive meat, poultry, and fresh fruits and vegetables, low income households are able to spend less for food, despite facing the

slightly higher prices that other studies have shown to exist.

The economizing practices observed of the poor may be conditioned, in part, by the types of foodstores from which they make their purchases. For example, the availability of store-brand products and volume-discounted large package sizes are likely lower in sub-supermarket outlets, which may be the only foodstores easily accessible to the poor. In addition, purchases constrained by restrictions in package size and product choice in the WIC nutrition program may affect outcomes for RTE cereal and cheese categories. Were it not for these constraints, differences in purchase patterns between the low- and higher income shoppers would likely have been even larger.

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¹²Bananas cost 45 cents per pound, on average, in this data set. The berries category includes strawberries, raspberries, blueberries, and cranberries. Berries cost \$1.59 per pound, on average, in this data set.

About this Series

Current Issues synthesizes economic analyses of the complex relationships in food markets of interest to officials responsible for public policy, decisionmakers in the industry, and researchers. Previous issues have addressed the increasing vertical coordination and integration of the industry; consolidation of retailers and orange juice prices; higher minimum wage and its effects on food prices; and how taxes affect food markets.

Also available in the Series

Consumer Acceptance of Biotechnology: Lessons from the rbST Experience

www.ers.usda.gov/publications/aib747/aib74701.pdf December 1998

By Lorna Aldrich and Noel Blisard (Nblisard@ers.usda.gov)

The controversial introduction of rbST, a laboratory version of bST, a growth hormone that stimulates milk production in cows, may provide hopeful lessons for other foods produced by biotechnology. Milk sales remained steady after rbST became available to dairy farmers, even though a multitude of public opinion surveys documented widespread concern about food safety and biotechnology. The rbST experience suggests that, while scientific evidence of food safety will not prevent controversy over biotech foods, controversy will not necessarily inhibit consumer demand for the food.

Price and Quality of Pork and Broiler Products: What's the Role of Vertical Coordination?

www.ers.usda.gov/publications/aib747/aib74702.pdf February 2000

By Steve W. Martinez (Martinez@ers.usda.gov)

Significant changes in vertical coordination of the U.S. broiler industry many years ago may provide useful insight into the rapid changes occurring in today's pork industry. Under production contracts and vertical integration, the broiler industry grew into the leader in U.S. meat production—outpacing beef and pork. Production efficiencies, quality assurances, and convenience in product offerings have led to falling chicken prices and rising per capita consumption with similar incentives for contracting in the pork industry. Consumers may also expect plentiful supplies of high-quality pork products at economical prices.

How Much Would Increasing the Minimum Wage Affect Food Prices?

www.ers.usda.gov/publications/aib747/aib74703.pdf February 2000

By Chinkook Lee (Chinlee@ers.usda.gov), Gerald Schluter (Schluter@ers.usda.gov), and Brian O'Roark

Will increasing the minimum wage increase food prices as well? This study shows that a simulated \$0.50 increase in the minimum wage, if entirely passed on to consumers, would have

increased food prices by less than 1 percent for most of the foods at foodstores and by 1 percent at eating and drinking places. Because these estimates were simulated using an economic model that assumed that firms did not alter their production processes when faced with higher minimum wages, these estimates are likely "upward bounds" of the price effects of a minimum wage increase.

How Do Taxes Affect Food Markets?

www.ers.usda.gov/publications/aib747/aib74704.pdf September 2000

By Patrick Canning (Pcanning@ers.usda.gov) and Marinos Tsigas

Several food market indicators would change if a flat income tax system replaced the current system. Our findings support the widely held view that even though a flat income tax system would increase national income, gains for consumers would be modest. Nor would economic growth be universal. A Federal flat tax structure would lead to smaller farm industries with lower than average growth rates, larger food industries with higher than average growth rates, slightly lower food production costs and consumer food prices, reduced net farm exports, and reduced net food imports. If States were to enact similar reforms, consumer food prices would drop 2.2 percent overall and over 5 percent in the Delta, Appalachian, and Southern Plains regions.

A Comparison of Vertical Coordination in the U.S. Poultry, Egg, and Pork Industries

www.ers.usda.gov/publications/aib747/aib74705.pdf May 2002

By Steve W. Martinez (Martinez@ers.usda.gov)

The need to protect relationship-specific investments creates incentives for contracts and vertical integration. In the presence of relationship-specific investments, market uncertainty from a number of sources helped to determine the type of contract/vertical coordination alternative selected.

Consolidated Markets, Brand Competition, and Orange Juice Prices

www.ers.usda.gov/publications/aib747/aib74706.pdf June 2002

By James Binkley, Patrick Canning (Pcanning@ers.usda.gov), Ryan Dooley, and James Eales

Consolidation in the marketing system seems to have had little effect on orange juice prices. We isolated the pricing behavior of brand marketers, wholesalers, and retailers by observing the retail prices for specific orange juice products, including leading national brands and private label brands, in 54 U.S. markets over a 1-year period. The data provided little compelling evidence that consolidated markets engaged in non-competitive pricing behavior. Competition between brands, however, particularly between private labels and leading national brands, did appear to lower average market prices.