THE CONSUMER MARKET FOR PECANS AND COMPETING NUTS

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Pecans contribute significantly to agricultural income in Georgia and in several other Southern states. Eleven Southern states produce the total U. S. commercial supply of pecans and during the years 1967-69, the average annual farm value of marketings was nearly $74 million. Georgia is the leading state in pecan production, contributing 27 percent of total U. S. production and 31 percent of total market value during this three-year period. Georgia produced 60 million pounds of pecans annually with an average 1967-69 farm value of over $23 million [4].

Pecans are only one of several competing nuts available to consumers in the U. S. market. English walnuts, almonds, black walnuts, peanuts, filberts, and brazil nuts may substitute for pecans in some uses depending upon existing price relationships. Maintenance or expansion of the pecan market depends on the availability and prices of pecans offered to consumers in the retail market relative to the availability and prices of competing nuts.

The quality of pecans marketed will vary depending on geographic production area, variety of nuts grown, and between seedling and improved varieties [6 pp. 22, 29]. Although USDA grade standards for pecans exist, little formal use is made of these grade standards in the marketing channels [2]. It is difficult, therefore, for consumers to objectively compare the quality of nuts in retail markets. The aggregate level of consumer demand for pecans might be enhanced if minimum quality standards were adhered to and if nuts of more consistent quality were maintained in retail markets. The result could be more effective product differentiation and a lowering of demand cross elasticity between pecans and competing nuts.

PURPOSE

The purpose of this paper is to present the results of a study of prices and availability of pecans in selected retail markets compared to competing nuts and to evaluate the quality of pecan meats available to consumers in these markets.

PROCEDURE

Six supermarkets were selected for study in each of 6 cities--Atlanta; Memphis; Philadelphia; Wochester, Mass.; Fort Wayne, Indiana; and Kansas City, Missouri. Each store was visited bi-monthly for a one-year period beginning in October, 1969. Visits were randomized by day of week and totaled 144 observations per city. Information was recorded on the type of nuts displayed in each store at the time of the visit and included type of meat, package size, package type, price, and brand. Records were maintained on both shelled and in-shell pecans, English walnuts, black walnuts, filberts, almonds, brazil nuts, and mixed nuts. Salted, or "party" nuts were not included in the study.

Once each month, enumerators purchased a package of pecan halves from each of the 36 stores. The brands to be purchased were specified at the beginning of the study and alternate brands were prescribed where out-of-stock conditions existed. The sample purchases were shipped to the Food Science Department of the Georgial Experiment Station for both laboratory and taste panel quality evaluation. An experienced researcher determined whether each sample met the USDA product identity and grade standards. A taste panel of 10 members evaluated each sample on a hedonic scale ranging from 1 to 10

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for appearance, aroma, color, texture and flavor. One was the lowest possible rating and 10 was the highest. Statistical significance of the quality variables, as determined by the taste panel, were tested with Analysis of Variance [3, pp. 99-109] and Duncan's New Multiple Range Test [1, pp. 23-29].

Availability

Almonds, black walnuts, English walnuts and pecans were generally available in each of the markets throughout the year in some form. It was not uncommon, however, for individual stores to be out-of-stock of certain nuts and types of meat on the day of the enumerator's visit.

The average numbers of nut selections shown in Table 1 were computed by dividing the aggregate number of observed brands, types of nuts, and types of meats by the number of store visits during the year. Considerable variation existed between regions and cities in the number of meat types available. Mid-Western markets had the greatest variety of nut selections; Northeastern markets the least (Table 1). Of the six markets, Philadelphia had the smallest average number of nut selections. The Southeast and Mid-West, based on the variety of available selections, appeared to offer a much wider selection of pecans.

Pecan halves and pieces and English walnut pieces were generally available in the largest assortment of package sizes (Table 2) and package types (Table 3). The most common types of packages were the polyethylene bag and the vacuum-packed can.

A total of 68 different brands of nuts were available during the year in the 36 supermarkets. Pecans and English walnuts appeared under the largest number of brands. In-shell pecans were not available year-round in any of the markets. Only the Mid-Western and Northeastern markets stocked in-shell English walnuts year-round. As expected, in-shell nuts were most readily available during the Thanksgiving and Christmas seasons.

Prices

Pecan halves were, in most cases, higher priced than the other types of nuts and averaged 16.6 cents per ounce in the three regions. Halves were priced highest in the Northeast and lowest in the Southeast (Table 4). In comparing prices of nut pieces, black walnuts averaged 16.5 cents per ounce for the three regions and were the highest priced nut pieces available. Pecan pieces averaged 15.5 cents per ounce

Table 1 AVERAGE NUMBER OF SELECTIONS OF SHELLED NUTS AVAILABLE TO SHOPPERS IN SELECTED RETAIL MARKETS, BY REGION, CITY, TYPE OF NUT AND TYPE OF NUT MEAT, 1969-70[a].

Type of Nut	Region and City								
	Southeast	Atlanta	Memphis	Northeast	Phila.	Worcester	Mid-West	Ft. Wayne	K. City
Pecans									
Halves	4.7	2.9	6.4	1.8	1.3	2.3	4.0	3.5	4.4
Pieces	2.3	1.6	3.0	0.6	0.2	1.1	3.0	2.9	3.2
Meal	0.1	b	0.1	0.1	0.1	b	0.5	0.8	0.1
English Walnuts									
Halves	0.2	0.1	0.3	0.7	1.1	0.3	0.2	0.4	b
Pieces	2.4	1.8	3.0	2.4	0.5	4.4	3.9	3.8	4.1
Meal	0.7	0.7	0.7	0.5	0.8	0.1	0.3	0.5	b
Black Walnuts									
Pieces	1.7	1.2	2.3	0.1	0.3	b	1.8	1.5	2.1
Meal	b	b	b	0.2	0.3	b	b	b	b
Amonds									
Whole blanched	0.7	0.2	1.2	0.4	b	0.7	0.6	0.5	0.8
Whole unblanched	b	b	b	0.4	0.2	0.6	0.5	0.6	0.5
Sliced	0.7	0.5	0.9	0.2	0.2	0.3	1.2	1.4	1.0
Slivered	1.1	1.2	1.1	0.8	0.6	0.9	1.2	1.4	0.9

[a]Includes all brands, package sizes and package types observed on 24 visits to each of six supermarkets in each city, a total of 144 observations per city.

[b]Less than 0.1.

Table 2 MAXIMUM NUMBER OF NUT PACKAGE SIZES AVAILABLE TO SHOPPERS IN SELECTED RETAIL MARKETS BY TYPE OF NUT, TYPE OF NUT MEAT, AND CITY, 1969-70.

City	Package Sizes Available[a]									
	Pecans			English Walnuts			Black Walnuts		Almonds	
	Halves	Pieces	Meal	Halves	Pieces	Meal	Pieces	Meal	Sliced	Slivered
Atlanta	6	4	1	3	6	3	2	1	3	2
Memphis	6	4	1	4	5	1	4	1	2	3
Philadelphia	3	4	1	4	7	4	4	1	3	3
Worcester	5	4	1	2	7	1	1	1	3	3
Fort Wayne	6	6	2	2	6	3	4	2	3	4
Kansas City	6	4	2	1	6	1	4	1	4	2

[a]By stated weight on packages and ranging from one ounce to sixteen ounces.

Table 3. MAXIMUM NUMBER OF NUT PACKAGE TYPES AVAILABLE TO SHOPPERS IN SELECTED RETAIL MARKETS BY TYPE OF NUT, TYPE OF NUT MEAT, AND CITY, 1969-70.

City	Package Types Available[a]									
	Pecans			English Walnuts			Black Walnuts		Amonds	
	Halves	Pieces	Meal	Halves	Pieces	Meal	Pieces	Meal	Sliced	Slivered
Atlanta	2	2	1	1	2	1	2	1	1	2
Memphis	2	2	1	1	2	1	2	1	2	1
Philadelphia	3	1	2	4	2	2	2	1	1	2
Worcester	3	2	2	1	3	1	1	-	2	3
Fort Wayne	2	2	1	1	2	2	2	1	1	1
Kansas City	3	2	1	1	2	1	1	1	1	1

[a]Predominantly polyethylene bags and vacuum packed cans but including also glass, window pack, overwrapped plastic cup, and fiberboard box. Where only one package type appeared, it was normally the polyethylene bag. Two package types usually included the polyethylene bag and the vacuum packed can.

Table 4 AVERAGE PRICES OF PECANS AND COMPETING NUTS BY TYPE OF MEAT AND BY GEOGRAPHIC REGION, 1969-70.

Type of Nut	Southeast	Northeast	Mid-West	All Regions
		(cents/ounce)		
Pecans				
Halves	15.0	18.6	16.3	16.6
Pieces	15.0	14.6	16.9	15.5
In-shell	3.6	4.8	4.5	4.3
English Walnuts				
Pieces	13.7	13.5	13.9	13.7
In-shell	3.6	4.4	4.1	4.0
Black Walnuts				
Pieces	15.9	16.6	16.9	16.5
Almonds				
Whole, blanched	11.4	13.0	12.6	12.3
Whole, unblanched	10.7	12.2	11.8	11.6
Sliced	12.5	12.8	12.3	12.5
Slivered	13.3	14.3	17.5	15.0
In-shell	3.8	4.3	4.3	4.1

and English walnut pieces averaged 13.7 cents per ounce. The Southeast generally had lower prices on all nuts regardless of brand, meat type, or type of package; Northeastern markets had the highest prices, probably because all nuts are imported to this region.

Only in the Southeast were pecans the least expensive in-shell nut (Table 4). Almonds were the most expensive in-shell nut in the Southeast, and in both the Northeast and Mid-West pecans were the highest priced in-shell nut.

Analysis of variance revealed no statistically significant relationships (5 percent level of probability) between price and geographic region or brand for a particular type of nut or meat. No statistically significant relationship existed at the 5 percent level of probability between price and quality as evaluated by the taste panel.

Quality of Pecans

During the year of study, 414 samples of pecan halves were purchased by enumerators in the test stores. None of the pecan samples purchased for quality evaluation specified the U. S. grade of the contents on the package. The samples were evaluated, however, to determine the number which would have met the specifications of U. S. Number 1 grade as prescribed by the U. S. Department of Agriculture [5].

The most common factor causing samples of pecan halves to fail to meet the U. S. No. 1 standard was excessive pieces in packages labeled "halves." This occurred in 31 percent of the samples examined (Table 5). Poor kernel fill, rancidity, excessive particles and dust, and dark color were other common defects. Some samples were in such poor condition that they could not be evaluated by the taste panel. Six samples purchased from stores were extremely rancid and two were insect infested.

A total of 407 samples were evaluated by the taste panel with respect to their appearance, aroma, color, texture and flavor. There were no statistically significant differences at the 5 percent level of probability in the average panel ratings between geographic regions. Based on the hedonic scale, flavor rated lowest in all regions and texture received the highest average rating (Table 6).

At the 5 percent level of statistical probability, there were no significant relationships between the factors rated–appearance, aroma, color, texture and flavor–and the time of year samples were purchased or the brand of pecan. There was a highly significant correlation (1 percent level of probability) between flavor and each of the other rating factors (Table 7).

Table 5 PERCENT OF PECAN-HALF SAMPLES NOT MEETING STANDARDS FOR U. S. NO. 1 GRADE, BY TYPE OF DEFECT, SELECTED RETAIL MARKETS, 1969-70.

	Samples Evaluated	Defects				
		Poor Kernel Fill	Rancid Flavor	Dark Color	Excessive Particles And Dust	Excessive Pieces
	No.	Percent				
Southeast	125	17.6	18.4	11.2	12.8	20.8
Atlanta	60	20.0	20.0	13.3	16.7	18.3
Memphis	65	15.4	16.9	9.2	9.2	23.1
Northeast	124	23.4	18.5	9.7	6.5	37.9
Philadelphia	59	22.0	16.9	15.3	3.4	11.9
Worcester	65	24.6	20.0	4.6	9.2	61.5
Mid-West	138	12.3	13.8	13.8	18.1	34.1
Fort Wayne	70	14.3	17.1	20.0	10.0	17.1
Kansas City	68	10.3	10.3	7.4	26.5	51.5
Total or Average	387	17.6	16.8	11.6	12.7	31.0

Table 6. AVERAGE TASTE PANEL RATINGS OF SELECTED CHARACTERISTICS OF SAMPLE PECANS, BY GEOGRAPHIC REGION, 1969-70.[a]

Characteristic	Region			Average
	Southeast	Northeast	Mid-West	
Appearance	6.63	6.52	6.64	6.61
Aroma	6.44	6.28	6.27	6.33
Color	6.58	6.48	6.62	6.56
Texture	6.66	6.56	6.78	6.67
Flavor	5.69	5.67	5.86	5.74
Average	6.40	6.30	6.43	6.38

[a]Based on a hedonic scale ranging from 1 to 10.

Table 7. COEFFICIENTS OF CORRELATION BETWEEN FLAVOR AND SELECTED RATING FACTORS, 387 PECAN-HALF SAMPLES, 1969-70.

Rating factors	Correlation Coefficient
Flavor - appearance	0.633**
Flavor - aroma	0.814**
Flavor - color	0.687**
Flavor - texture	0.649**

**Significant at the 1 percent level of statistical probability.

CONCLUSIONS

The results of this study indicate that there is a wider assortment of pecans available than of most other types of nuts in the markets studied. However, in the Northeastern region a much smaller selection of pecan meat types and package types were available to consumers than in other regions. With the exception of black walnuts, pecans were generally the highest priced nuts available in retail stores.

Since pecans are marketed at retail without specification of grades, consumers have no objective basis for quality evaluation in making purchase decisions. Quality evaluations of purchased pecan-half samples indicated that about one-third of the pecan halves available at retail do not meet minimum U. S. Number 1 standards, primarily because of the presence of excessive pieces. Poor kernel fill, rancidity and excessive particles and dust were also prevalent factors contributing to poor quality. Based on taste panel ratings, the poorest quality of pecan halves were found in the Northeast and the highest quality in the Mid-West.

Adherence to USDA grade standards for pecans sold in retail markets would doubtless improve the level and consistency of the quality of pecans available to consumers.

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