Food consumed at home represents a large portion of the family budget. For rural residents, the costs of attaining a market basket of food may be higher than their urban counterparts, as costs of time and transportation to secure the market basket may be greater. This study examines the grocery shopping practices and the stores shopped by the rural grocery shoppers.

The following hypotheses were tested:

1) Rural grocery shoppers' selection of low priced stores is independent of whether or not they value low prices.

2) Whether or not rural grocery shoppers identify low prices as first or second in importance in choosing a grocery store is independent of:
   a) sex,
   b) age,
   c) income,
   d) marital status,
   e) number in household,
   f) education of grocery shopper,
   g) employment status of grocery shopper, and
   h) Extension membership.

3) The number of major grocery shopping trips by shoppers not in the labor force is independent of the distance the shopper travels between home and the store.

A questionnaire was designed and sent to 259 randomly chosen rural families. One hundred usable questionnaires were returned with information on which stores were
patronized, distance between stores (and work), amount of money spent at each store, number of trips made, number of trips combined with other activities, amount of food raised for personal consumption, and demographic characteristics of the shopper.

From the information received on the questionnaires, 14 stores in four towns were identified as those most frequently patronized by the shopper sample. A Consumer Price Index market basket for the Pacific Region was priced weekly for four weeks at the 14 stores. The mean prices of market basket items at all stores were weighted to reflect the importance of the items in a family budget. Most of the stores retained their relative positions when ranked by weighted and unweighted prices. Tests were run to determine significance of differences between stores and between weeks. Difference in mean market basket prices by stores was statistically significant; however, difference in prices by weeks was not significant.

A lowest price weighted market basket was computed for each area and for all 14 stores. Shopping the maximum number of stores priced in an area yielded the lowest price market basket for that town. For 12 of the 14 stores, shopping one less than maximum yielded a lower price basket than shopping any single store. The mean savings by shopping all stores in an area priced in this study versus shopping the lowest price single store in an area was $3.00 (using a weighted market basket).
Analysis of the collected data indicated the following: 1) rural grocery shoppers who select lowest price stores are those who value low prices; 2) whether or not rural shoppers identify low prices as the most important influence on their grocery shopping behavior is independent of the shopper's sex, age, family income, marital status, number in household, education, employment status, or Extension membership; and 3) the number of major grocery shopping trips by shoppers not in the labor force is negatively associated with the distance between the home and the store.

Additional data indicated that those respondents employed outside the household made slightly more trips to the store per week than those homemakers not employed. Shoppers who valued low prices shopped slightly fewer stores than those not valuing low prices. According to the demographic data collected, the sample can be described as follows: the mean household size was 3.64; one half the respondents were not employed outside the household; 60 percent had twelfth grade or less education; 20 percent of the sample were under age 31, 37.5 percent ranged in age from 31 to 40, and 41.5 percent were over age 40; and 33 percent indicated a household income of over $20,000 annually.
PRACTICES AND PREFERENCES OF RURAL GROCERY SHOPPERS IN SCIO, OREGON

by

Janice E. Amling

A THESIS submitted to Oregon State University in partial fulfillment of the requirements for the degree of Master of Science

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Since 1973, food prices have risen at annual rates varying from a high of 16 percent in 1973 to a low of two percent in 1976. The anticipated rise in food costs for 1978 is ten percent (Survey Shows Price Rises 1978). Year to year changes depend on such variables as: food production here and abroad, productivity throughout the sectors of the food system, demand, and government policy (Donald 1977). Other factors affecting food outlook are marketing costs, weather, energy costs and food legislation (Farrell 1978).

Food consumed at home claims a large portion of a family's budget. The relative importance of food at home in the Consumer Price Index (CPI) in use in December 1976 was 18.46 percent and for December 1977 was 18.68 percent. For total food consumed, the relative importance in the CPI was 23.67 percent for December 1976 and 23.95 percent for December 1977 (United States Department of Labor 1978c). The Department of Labor, in its autumn 1976 summary of annual budgets for a four-person family at three budget levels of living in urban United States, cited the following percents of consumption expenditure allocated for food: lower budget, 36.8; intermediate budget, 31.2; and higher budget, 28.5, (United States Department of Labor 1977b). In autumn 1977, the same family spent the following percents of consumption expenditure for food: 36.8 for higher budget, 31.4 for intermediate budget, and 28.7 for higher budget (United States Department of Labor 1978a). Recent rapid increases in food prices have increased the share of consumption expenditures for food
relative to other items in the family budget. As varying demands are made upon the family's paycheck, the food category of the family budget is an area that can be cut back more readily than some other areas, but only so far and for a limited amount of time if the family is currently eating a low-cost diet.

As compared to the urban shopper, the rural consumer is faced with the added costs of longer travel time and higher transportation costs to shop in distant towns if they choose to shop in town. A study by Devine and Hawkins (1972) pointed out that in many cases insufficient food shopping information was available to the consumer to make rational decisions on food purchasing strategy. He found that once consumers are aware that differences exist within markets, they will seek additional information. Maynes (1969) found that by taking the necessary time and effort to make better decisions, the consumer's purchasing power can be increased.

In 1970, 33 percent of Oregon's population (United States Bureau of the Census 1973b) and 26.5 percent of the total United States population (United States Bureau of the Census 1977) were rural. Little attention has been given to the Oregon rural grocery shoppers to determine: 1) whether they grocery shop in their own town or shop in larger towns, 2) whether they save money by their choice of markets, and 3) the distance they drive to shop.

An evaluation of rural shoppers can contribute to the enhancement of Extension study groups in rural Oregon. The data can be used to establish the role study groups play or can play in the grocery shopping practices of rural Oregon. The Extension Service can determine how effectively it is meeting the needs of the rural residents and take appropriate measures.
Need for the Study

There is a need to determine what decisions rural residents are making about choice of grocery stores, frequency of shopping, distance traveled, and value placed on low price food baskets. An examination of rural shopping habits could indicate a need for more information on methods to reduce total food basket costs, including the number of stores to shop. A model for decision-making could assist rural grocery shoppers in choosing a shopping behavior compatible with goals.

Statement of the Problem

Rural grocery shoppers are faced with additional time and transportation costs when shopping in distant towns. Are these costs offset by alleged lower food prices in the larger towns? The purpose of this research was to study the grocery shopping practices of rural Oregon grocery shoppers.

Objectives

The objectives of this study were to:

1) examine the perceptions and practices of rural grocery shoppers as they relate to low grocery prices;
2) identify characteristics of grocery shoppers obtaining lowest price market baskets; and
3) determine a model for selecting the number of grocery stores one must patronize to achieve the lowest price market basket.

Hypotheses

The following hypotheses were tested:

1) Rural grocery shoppers' selection of low priced stores is independent of whether or not they value low prices.
2) Whether or not rural grocery shoppers identify low prices as first or second in importance in choosing a grocery store is independent of:
   a) sex,
   b) age,
   c) income,
   d) marital status,
   e) number in household,
   f) education of grocery shopper,
   g) employment status of grocery shopper, and
   h) Extension membership.

3) The number of major grocery shopping trips by shoppers not in the labor force is independent of the distance the shopper travels between home and the store.

Operational Definitions

**Grocery shopper:** the person in the family purchasing the majority of groceries for the family's consumption as identified by the respondent.

**Lowest price market basket:** the total market basket of goods (as defined by the Consumer Price Index, Department of Labor) with the lowest price, purchased at one or more stores.

**Major grocery shopping:** grocery shopping where more than five items are purchased.

**Rural:** communities with population of 2,500 or less, whether incorporated or unincorporated (United States Bureau of Census 1973a).

**Store loyalty:** degree to which grocery shoppers limit their shopping to a particular store.

**Unweighted market basket:** a market basket of goods, (as defined by the Consumer Price Index, Department of Labor), the value of which is the total price of one unit each of the individual items.
Weighted market basket: a market basket of goods assembled by the Department of Labor to represent the variations in quantities of individual items that a family would actually purchase. The weighting reflects each item's importance in the family budget. The dollar value of the weighted market basket is the sum of the price of each individual item that has been multiplied by the item's weighting factor.

Assumptions
1) The market basket priced includes the same items that the families in this study actually purchased.
2) The period studied is representative of other periods.
3) The respondents and the researcher gave the same meaning to the terms and concepts on the questionnaire.
4) The respondents gave complete and accurate information.
5) The sample studied is not different from the Scio families not in the sample.

Limitations
1) The population is restricted to a single rural location.
2) The responses are limited by the recall and perceptions of the grocery shoppers.
3) The sample is limited to those who chose to return the questionnaire.
4) Only households with telephones were included in the population that was sampled.
II. REVIEW OF THE LITERATURE

Everyone consumes food, each at different levels according to individual needs and other criteria. According to Brunk and Darrah (1955), food consumption is affected by income, education, occupation, nationality, and somewhat by religion and age. Brunk also states that food purchases are affected by ads, fads, and health information. Another study (Food Purchasing Practices 1972) attributes variability of grocery expenditures in the population to per capita income and stage in the family life cycle.

Engel (Monroe 1974) found that with increased well-being, absolute expenditures for food increase, though relative expenditures for food decrease. Engel concluded that the lower the family income, the greater the proportion of total expenditures required for food.

Just as there are numerous variables that determine food consumption, there is also a variety of factors that affect the shopper's choice of a grocery store. This chapter reviews the literature as it relates to this study. The four general topics discussed are: 1) characteristics of grocery stores; 2) store loyalty; 3) effects of employment on grocery shopping; and 4) variables affecting total cost of the market basket, including foods costs, imperfect competition, consumer's knowledge, amount and value of time, and driving costs.

Characteristics of Grocery Stores

The most important influence on choice of grocery stores may be attributed to the customer's perception of grocery store characteristics. Progressive Grocer (Want to Sprout Customer Loyalty? 1977) published an article in which the author demonstrates the relative importance of 37 grocery
store factors for the years 1973, 1975, and 1977. The only two variables to maintain their relative importance over the years are "cleanliness", first, and "sell hot foods to take out or eat in store", last.

Brown (1968) noted that for a customer to consider patronizing a store, it must be clean and uncrowded. In this study, 1,000 respondents in five cities rated nine reasons for selecting a particular grocery store. The participants chose convenience as number one and price as number two.

Meier and Spies (1978) concluded from their study of 475 Corvallis, Oregon grocery shoppers, that food price was the single most important consideration in selecting a food store. Store location ranked fourth and store cleanliness ranked fifth in their survey.

Store Loyalty

The characteristics of the individual grocery store may influence a shopper's choice of stores, but characteristics of the grocery shoppers dictate how loyal they are to their choices. Families with high incomes are more likely than low income families to patronize only one store (Brunk and Darrah, 1955). Brunk and Darrah speculate this could be caused by the more price conscious low income families doing more shopping around, while the high income families were less concerned with food specials, but desired more service.

In direct contrast to Brunk and Darrah, Tate (1961) found one-store shoppers tend to be low income families. Fifty-six percent lived in less populated areas of the country (2,500 or less) and had a grade school education or were farmers. Persons shopping high numbers of stores tended to be middle or upper income families, lived in large metropolitan areas, had high school or college education, and were white collar workers or retired. These persons also
had a slightly greater tendency to purchase special sale price merchandise. Frank (1969) reported that high income and big markets usually indicated low store loyalty.

**Employment**

Employed homemakers experience more time constraints than unemployed homemakers. Hall (1970) states that those homemakers employed 25 or more hours per week spend fewer hours at management and shopping than those working 15 hours or less. Walker (1969) agrees, adding that employed homemakers use less homemaking time and tend to eliminate some household work. However, Walker and Woods (1976) found that employed wives shop more frequently than non-employed homemakers.

Hacklander (1978b) reports there is little difference between employed and not employed homemakers in the frequency of their shopping or in the number of stores they frequent for major grocery shopping. Unemployed homemakers however, take more time to select their groceries (approximately 54 minutes for employed homemakers and 62 minutes for unemployed homemakers).

**Cost of The Market Basket**

The total cost of a market basket of food includes the cost of the food, the amount and value of time required to shop (including time for making shopping lists, reading newspaper ads, collecting coupons, etc.), and transportation costs.

**Differences in Food Prices**

Grocery store managers develop pricing strategies that differentiate their stores from the others. Stores will promote "everyday low prices", "super-savers", double-coupons, special prices with a minimum $10.00 purchase, etc. Sales volume and affiliation with other stores influence pricing strategies.
Minichiello (1970) studied retail prices of identical food items carried by both discount and conventional supermarkets of the same company. Prices were compared for large, voluntary*, and small chains for produce, meats, grocery, and other products categories. The large and voluntary chains priced almost all identical items lower in the discount food stores than in conventional supermarkets. The discount store of the small chain sold most of its identical items at prices lower than at the conventional market with the exception of identical prices for all produce, 25 percent of groceries, 40 percent of dairy products, and some meats, frozen goods and baked goods.

**Imperfect Competition**

Grocery stores enjoy flexibility in their pricing strategies. The merchandise and services offered vary among stores and may be affected by competition.

Imperfectly competitive markets are characterized by: 1) many buyers and sellers, each seller having some degree of freedom to affect price; 2) differentiable products or aspects of the retail store; and 3) consumers not having perfect information regarding relative prices at different stores, availability, or conditions of sale. Bivens (1968) suggests from his study of the food price competition in Milwaukee, that there exists imperfect competition among retail food stores with evidence of market segmentation among and within the sections of Milwaukee studied. Bivens concluded that a fairly stable hierarchy exists among food chains. Devine and Hawkins (1972) indicate that lower prices are reflected in more competitive regions.

* Voluntary in this sense refers to an independent grocery store that voluntarily elects to be a member of a buying association.
Consumer's Knowledge

Neoclassic demand theory assumes the customer has perfect knowledge or awareness of all prices for an item within a given shopping area. However, consumers are probably faced with imperfect knowledge regarding the availability, quality and price of commodities within their market area (Prato 1977). The cost of keeping current on all prices would be prohibitive, unless the relationship of asking prices in successive time periods is constant (Stigler 1961). Purchasing power is increased through better decisions made possible by perfect knowledge. Sproles, Geistfeld and Badenhop (1978) concluded that consumer information has a significant effect on increasing consumers' efficiency of choice, especially if extensive information on competitive product characteristics is available.

Winter (1975) studied consumers' response to information in a test situation. He found that subjects utilized information when lack of time was not a problem and when the subjects did not have more attractive things to do. Accordingly, employed shoppers might tend to spend less time acquiring information. Winter also found subjects were selective in the types of information upon which they focused. Of most concern were items comprising a major part of the individual's food dollar, and of less concern were items where price was less important than other variables (i.e., quality of merchandise, store cleanliness, etc.). When the subjects were convinced that their prior expectations were in error, they were more likely to seek information. Simplified forms of information increased comprehension only if the amount of information lost in the simplification process was small. In Winter's sample, high income groups responded most positively to the provided information.
a) Price Perception

Brown (1969) points out that cues perceived by the customers influence the price image of grocery stores. In his study, large volume stores were viewed as lower in price. High quality or additional services were associated with a higher store price-level.

Brown (1968) indicated in another study involving five cities throughout the United States that price conscious shoppers are the most valid perceivers of grocery store prices. Price consciousness was a better predictor of perceptual ability than the price level of the store.

Brunk and Darrah (1955) state that families with low amounts of income for food tend to be more price conscious.

b) Importance of Low Price to Customers

Not all grocery shoppers value perfect price knowledge. The Progressive Grocer Survey (Want to Sprout Customer Loyalty? 1977) indicates that of 37 factors of importance to shoppers the rank value placed on low prices fluctuated from fifth in 1973 to third in 1975 and to fifth again in 1977. Wells and LoSciuto (1966) concluded that concern with price differs from product to product and that concern with price is far from universal.

Hacklander (1978a) divides grocery shoppers into three categories: time/money conscious (concerned with price and cost of food); careful shoppers (read labels, concerned with food safety and nutrition); and satisfaction oriented (value quality, sensory appeal, newness). Hacklander concluded that more consumers appear to be satisfaction oriented (n=454) rather than time/money (n=372) or careful shopper (n=211) oriented.

Meier and Spies (1978) asked Corvallis, Oregon grocery shoppers to suggest improvements for food stores. Faster checkout services was mentioned 19.3 percent of the time and lower food prices and improved labeling (price, nutrition, and metric measures) were each mentioned 12.8 percent of the time.
c) Reaction to Price Change

Customers with knowledge of price change may elect to alter their shopping behavior. Battalio et al (1974, p. 58) in reporting on a study conducted in a controlled environment, stated, "(there is a) substantial substitution between commodity groups in response to price changes." He also cited that "consumption patterns do not immediately return to their original values following displacement."

Customers have become better shoppers as a result of escalating food costs. According to an Economic Research Service survey (United States Department of Agriculture 1976b), many people improved a variety of their shopping skills in 1976 over their 1975 level. The survey selected and reported on the followed criteria for determining good shopping skills: checking newspaper ads for food specials (30 percent started checking); saving and using food coupons (30 percent were using); and buying food in volume (25 percent were buying in volume). Twenty percent more consumers were making food from scratch, 17 percent were shopping closer to home (one-third of whom were doing so to conserve gasoline), and ten percent were making fewer trips to the store in 1976 when compared to 1975. Sixty percent of the participants were buying less of some food types, while 25 percent were buying more of certain lower-priced foods.

Oregon grocery shoppers (Meier and Spies 1978) reported that they made adjustments during periods of high rates of inflation. The responses included: buy food specials, increase home production, buy in season, buy in bulk, and plan meals (33.6 percent); cut back on highly inflated foods, meats, coffee and sugar purchases (27.6 percent); buy less junk food and buy more nutritious foods (17.0 percent); buy lower quality food and use store brands (13.1 percent); and reduce amount of food consumed (8.7 percent).
d) Cost of Search for Information

Perfect knowledge is affected by the cost of information search. Maynes (1969) stated customers should continue their search as long as expected savings are greater than the cost of search. Search should continue if: 1) the item is relatively large in the long run household budget, 2) the search cost is low, or 3) the expected distribution of price or quality is large. Maynes also asserts that for those who enjoy shopping, the subjective search cost may be negative. According to Swagler (1975) the optimum amount of search depends on the individual, the character of the market, the product in question, and the situation.

Stigler (1961) writes that the wider the dispersion of prices and the greater the expenditure on the commodity, the greater the expected savings from a given search. The cost of search is proportional to the number of sellers, as time is the primary cost. The value of the search is the amount by which the customer reduces the expected cost.

Amount of Time for Grocery Shopping

Grocery shopping takes time. As the total number of stores shopped increases, the total shopping time in stores increases, but at a decreasing rate per trip as shown in Table 1 (Crowell 1974).

<table>
<thead>
<tr>
<th>Number of Stores Shopped</th>
<th>Shopping Time in Minutes</th>
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<tbody>
<tr>
<td>1</td>
<td>27 minutes*</td>
</tr>
<tr>
<td>2</td>
<td>46 minutes, total</td>
</tr>
<tr>
<td>3</td>
<td>69 minutes, total</td>
</tr>
<tr>
<td>4</td>
<td>82 minutes, total</td>
</tr>
</tbody>
</table>

* these figures are rounded for convenience
Hacklander (1978b) states that major grocery shopping is essentially a one-stop activity requiring approximately one hour to accomplish excluding checkout time.

**Value of Time**

Time costs can add significantly to the cost of a market basket (Crowell 1974). Two methods of evaluating the value of time include the market value for hiring work done and the opportunity cost of grocery shopping.

**a) Market Value for Hiring Work Done**

If a family were to hire a person to shop and deliver the groceries, a minimum fee of $2.65 per hour would be required by federal law. A social service agency in Albany, Oregon, Linn County Information Referral and Volunteers Service, reports in-home domestic workers receive $3.00 to $4.00 per hour (Abbott 1978). Benton County, Oregon, "Homemaker-1" employees that have 120 hours of special training to help ill homemakers, receive $4.07 per hour for their services; however, the actual cost to the county is $7.35 per hour when administrative costs, fringe benefits, and cost of mileage are added (Hardesty 1978).

**b) Opportunity Cost of Grocery Shopping**

Schary (1971) expressed the view that the value of time should be measured as the opportunity cost of foregone income or of participation in other activities. Using this theory, the value of employment is at least $2.65 per hour as determined by the federal minimum wage (Senders 1978).

Eighty percent of the female job growth in rural areas between 1960 and 1970 was in clerical, service, or factory worker positions, with the highest growth rate in clerical work (United States Department of Agriculture, 1978). According to the Area Wage Survey for Portland, Oregon (United States Department of Labor, 1977a), a female secretary employed by a manufacturing firm earns an average
of $5.15 per hour, and a typist receives an average of $3.58 per hour.

Driving Costs

As the total number of miles traveled to grocery shop increases, the total market basket cost increases. Driving costs are a product of total number of miles and cost per mile.

a) Distance to Stores

Driving to the store is costly in terms of time and transportation and needs to be weighed against the value placed on larger stores or more selection from stores in larger towns. In the Thompson study (1971), shoppers in towns ranging in size from 1,500 to 6,500 were surveyed. Those shopping out of town at least once in the past six months tended to have higher incomes and younger ages than those shopping exclusively in their home town. The reason often cited for outshopping is that local stores carry too small a selection. The types of items purchased out of town are the same types as purchased by local shoppers.

Bishop and Brown (1969) concluded from their study of urban consumers, that variables associated with the distance traveled by a dispersed population include: the number of retail functions available at the first choice retail center, trip frequency, and the number of retail functions available at the second choice retail center. The purpose of the trip (single or multi-purpose) affects distance traveled. The more retail services offered in close proximity to a store, the larger the distance people will drive to get there. In Bishop and Brown's study, the frequency of shopping trips was negatively associated with distance but the relationship was not statistically significant.
According to Brown (1978), consumers made more visits to nearby stores than to more distant stores. Shoppers chose nearby stores when buying only groceries and more distant stores when also purchasing non-food items. When making multiple purpose trips, consumers patronized grocery stores in large shopping centers more often than when making single-purpose trips. Customers chose more distant stores when the amount of purchase was larger, and chose larger stores for major trips (vs. convenience trips).

b) Frequency of Trips

Frequency of trips affects total miles driven to the grocery store. Since 1954, a trend has developed toward more frequent shopping trips (Schapker 1966). Multiple car ownership, early-week advertising and long store hours have contributed to this trend.

Douglas (1976) reported that frequency of shopping is related to the number of children. Also, employed homemakers shop less frequently and make greater use of their spouses for grocery shopping. Walker and Woods (1976) disagree stating that employed wives shop more frequently than non-employed wives.

Hacklander (1978b) and the ERS survey (United States Department of Agriculture 1976b) agree that shopping once a week is representative of most grocery shoppers. Brunk and Darrah (1955) contend customers average three trips per week.

c) Number of Stores Shopped

Shopping for specials at a variety of stores may be one method of cutting total market basket costs. Hacklander (1978b) states that unemployed homemakers shopped in an average of 1.59 stores and employed homemakers shopped in an average of 1.34 stores. The ERS survey (United States Department of Agriculture 1976b, p. 5) indicated consumers "did their main food shopping once a week and at only one store."
Degree of multistore food shopping is increased by two factors: 1) the stage in the family life cycle of homemaker (over 35 years of age with either no kids or with pre-schoolers) and 2) three or more cars available to the family (Prasad 1972). Those families shopping multiple stores were more likely to have larger food budgets, make more food shopping trips more frequently, and spend more time shopping per week.

Cunningham (1966) reported that no clear-cut pattern emerged as to the total number of stores shopped by high or low store-loyal families. The average family makes 48.6 percent of its total food purchases at its favorite store, 20.9 percent at the second store, 9.9 percent at the third store, 5.7 percent at the fourth store, 3.6 percent at the fifth store, and 2.5 percent at the sixth store. The reasons that families gave for shopping a large number of stores include: number of accessible stores, travel patterns of family members, number of fill-in purchases, and homemaker's preference for number of suppliers.

The United States Department of Agriculture Home and Garden Bulletin No. 183 (1976a) states that store-hopping for specials may be pennywise, but costly in time and transportation costs if the stores are not close together. The Crowell study (1974) conducted in Columbus, Ohio, indicated that to achieve the lowest cost market basket from four stores located within a five-mile area, all four stores should be shopped. This holds true even when including transportation costs. When time costs were added, shopping at two stores resulted in the lowest cost market basket 75 percent of the time.

Lifquist (1965) looked at price changes in two supermarkets. Her conclusion was that when considering national brands, there was no difference in market basket price between
stores if all shopping was done in only one store. However, if the customer had shopped the best prices at both stores, a ten percent savings would have resulted.

d) Cost of Operating an Automobile

The cost of operating an automobile varies directly with vehicular weight. Runzheimer and Company have compiled figures for operating and maintaining 1978 model automobiles in rural areas (American Automobile Association 1978). The costs include: insurance ($100 deductible comprehensive, $250 deductible collision, $100/300,000 public liability, $25,000 property damage); state taxes; registration fees; depreciation; gas; oil; maintenance; and tires. Based on driving 10,000 miles annually, the total costs per mile are:

- subcompact 14.2 cents,
- compact 15.9 cents,
- intermediate 16.4 cents, and
- standard 18.2 cents

In summary, rural residents may have more costs for grocery shopping in terms of higher transportation and time costs. Crowell's study (1974) examined the economic feasibility of grocery shopping at more than one store for urban dwellers. Crowell determined that when including the costs of time and transportation in the total market basket cost, the lowest cost market basket could be obtained by shopping a combination of two stores, 75 percent of the time. The results of this researcher's study should help rural grocery shoppers determine a pattern of grocery shopping that will be most beneficial for their unique needs.
III. METHODOLOGY

This exploratory study was designed to identify perceptions and practices of rural grocery shoppers of Scio, Oregon. Relationships investigated include: valuing low prices and specific demographic characteristics, valuing low prices and selection of lowest price grocery stores, and distance traveled to grocery shop and number of trips made by the unemployed grocery shopper. This chapter describes: 1) development of the instrument, 2) selection of the sample, 3) collection of the data, 4) selection of the grocery store sample, 5) development of the market basket pricing instrument, 6) collection of the market basket data, and 7) data analysis procedure.

Development of the Instrument

Preliminary information on grocery shopping practices of Scio study group members was gathered by a Linn County Extension agent. An awareness exercise had been designed asking location and reason for choice of grocery stores, frequency of trips, and amount of money spent on food each week. This information was used as a guide for developing this researcher's two-page questionnaire to collect data on the grocery shopping practices and perceptions of the residents of Scio, Oregon. The resulting questionnaire included questions on where the respondents shopped, number of trips made to the grocery store per week, amount of money spent at each store per week, distance to each store from home and from work, whether respondents combined grocery shopping trips with other activities, whether the respondents raised food for their own consumption, and demographic characteristics of the grocery shopper.
The content, clarity and sequence of the questions were reviewed by a panel of experts. Included in the review panel were faculty from the Family Resource Management Department and staff from the Survey Research Center, Oregon State University. Fourteen members of an Albany Extension study group pilot-tested the questionnaire. The final form (Appendix A) was approved by the Committee for the Protection of Human Subjects.

Selection of The Sample

Scio, Oregon, in Linn County, was chosen as the rural community (population 490) for this study. Many of the residents of Scio commute to the surrounding larger towns of Albany, Stayton, and Salem for employment in the rare metals, lumber and food processing industries. Part-time farming is a prevalent occupation for many Scio residents. The mean income for men in Scio is $15,000 and for women, $8,000 - $9,000 (Olds 1978). Scio is judged to have a socioeconomic level comparable to surrounding towns its same size (Olds 1978).

It was determined that one-fourth of the names in the Scio telephone directory would yield approximately 100 returned questionnaires. The numbers one, two, three, and four were put into a hat. Number four was randomly pulled from the hat, establishing that every fourth name would be used from the directory. The sample consisted of the 259 names chosen. Each of these names was considered to represent an individual household.

Collection of The Data

A cover letter and a stamped, self-addressed, numbered envelope were mailed with the questionnaire to the sample households. The respondents filled out the questionnaires at home in privacy. As questionnaires were returned,
the number in the lower left-hand corner of the envelope was recorded. Two mailings of the questionnaire, ten days apart, were required for a return of 106 questionnaires. Of these, six were returned with insufficient information to be usable. With the removal of these six questionnaires, 100 usable respondent questionnaires remained for use in this research study.

**Selection of the Grocery Store Sample**

Returned questionnaires were assigned numbers. These numbers were used to design a chart to tally which stores each respondent shopped. Thirty-seven stores in eight towns were mentioned by the 100 respondents. Stores in Albany, Scio, Stayton and Salem received the most tallies. Some individual stores were eliminated to avoid having to price an excessive number of stores. However, the remaining stores were chosen to allow retention of the maximum number of usable questionnaires consistent with the scope of this study. Specialty food stores were also eliminated as they do not carry most of the items in the CPI market basket. As a result of this effort, 14 stores in the four towns were chosen to be priced, and 66 of the 100 usable questionnaires could be retained for the purpose of testing Hypothesis 1. The map in Appendix B illustrates the relationship of Scio to the surrounding towns and the 14 stores.

**Development of the Market Basket Pricing Instrument**

The market basket data were collected using the Crowell format (Crowell 1974). This method prices similar brands of specific products weekly at the same stores. The Bureau of Labor Statistics' market basket used in the Pacific Region in January 1978 was used for collecting prices. A list of brand names was chosen to make the market basket as similar
as possible among stores. Only those fresh fruits and vegetables available were included. With the assistance of the produce manager from one of the stores, the average weight per item was established using the average weight per produce box and the average number of units per box. This information was necessary for produce sold by item or by pound, where the data collected needed, alternatively, to be priced per pound or per item, respectively. The 93 items priced included eight bread and cereal products; 29 meat, poultry and fish products; six dairy products; 29 fruit and vegetable items; and 21 other products. The market basket can be found in Appendix C.

Collection of The Market Basket Data

A 93 item basket was priced the weeks of April 27, May 4, May 11 and May 18, 1978, at 14 stores in the Linn and Marion County areas. No weeks of unusual activities or promotions were included. Prices were collected on Thursdays and Fridays after the weekly specials were published in the newspapers. Special prices on the exact items and brands being priced were used for that week. Special prices on the same item, same size but different brand were noted. When the prescribed item was unavailable at a store, a suitable brand or size substitution was made (price adjusted for size difference).

The 14 stores were assigned letters. These letter designations were used to report store comparisons. Upon completion of collecting the market basket data, the researcher noted there were insufficient meat prices for stores B, L, and N. Store B carried no butchered meat, while stores L and N were small "mom and pop" stores with very few fresh meats stocked. If all stores were to be comparable, missing prices would have to be generated; however, with 20 of 29 meat items missing in from one to three of these stores each week, no effort was made to generate missing meat prices for stores B, L, and N as this was
judged to be statistically unsound. A policy was established to generate prices for missing items if only two prices were missing for the week for the food item (except for the missing meat prices just mentioned). Twenty pieces of missing data were calculated using the method in Snedecor and Cochran (1967). This is a standard method utilizing all data collected:

\[ X = \frac{aT + bB - S}{(a-1)(b-1)} \]

Where
- \( a \) = number of stores
- \( T \) = sum of items for one store
- \( b \) = number of items
- \( B \) = sum for that item
- \( S \) = overall sum

An insufficient number of prices was collected for lamb chops, whole smoked hams, veal cutlets, grapes, strawberries and spinach. These items were omitted from all 14 stores resulting in an 87 item market basket for comparison of prices at the 11 stores (stores B, L, and N omitted). When all items were omitted for which there were any missing data for any of the 14 stores, a 56 item market basket remained for the comparison of the 14 stores.

Market basket mean prices were calculated for 11 stores (87 items) and 14 stores (56 items) using the unweighted data. These unweighted market basket means are shown in Tables 4 and 7 (Chapter IV). In order to demonstrate the prices an average family would pay for a typical market basket, the individual market basket items were weighted. The Relative Importance of CPI Items "Food at Home" classification (United States Department of Labor 1978b) was made equal to 100 percent of a family's market basket and each category within it multiplied by the same factor to retain its relative importance to the "Food at Home" classification. Since the researcher's market basket included fewer items than the CPI market basket, adjustments were made within each category to retain the relative importance of the
individual items. To make these adjustments, the weights of the items priced in a category were totaled and the individual weights were divided by this total to derive the individual item's percent of the category. This percent was multiplied by the value of the weight of the category. The weighting factors are shown in Appendix C. The weighted market basket price means are presented in Tables 4 and 7. The weighted market basket (rather than the unweighted) more nearly represents the mix of food items families would buy, and therefore is used for analysis of data in this study.

Analysis of variance and least significant difference tests were applied to determine if there was a significant difference between mean market basket prices by stores and weeks. This was done on four market baskets: weighted and unweighted each for 11 (B, L, and N omitted) and for 14 stores.

Data Analysis Procedure

The data collected from the questionnaire and the grocery stores were used to test this researcher's hypotheses. The methods of analyzing this data are described in this section.

Hypothesis 1: Rural grocery shoppers' selection of low priced stores is independent of whether they value low prices:

The first hypothesis used data for those respondents who mentioned shopping at one or more of the 14 stores priced. Of the 100 respondents, 34 were omitted as they shopped at a combination of stores that included more stores than the 14 priced. Sixty-six acceptable questionnaires resulted to test this hypothesis. The data were examined to describe the respondents by whether or not they selected low price stores and by whether or not they valued low prices.

To determine whether or not the respondents selected low price stores, the following procedure was used:
1. Each store's mean price was divided by the price of the lowest price store. The lowest price store was given a value of 1.000 (or 100 percent of the lowest price store) and the highest price store was assigned a value representing its percent of the lowest price store.

2. The 66 questionnaires were examined to identify the percent of the week's food expenditures spent at the respondents' choices of stores.

3. The percent of the previous week's food budget spent at each store was multiplied by the appropriate weight for that store. The sum of the scores represented the respondent's total score:

\[ T = \sum S_i W_i \]

Where:
- \( T \) = total score,
- \( S_i \) = percent of food budget spent at stores 1-4,
- \( W_i \) = weight of stores 1-4.

4. The median value of the respondents' total scores was chosen to differentiate between those respondents who chose and did not choose the lowest price stores.

To determine whether or not a respondent valued low prices, question 10 was used. Those respondents who ranked low prices as the first or second most important quality of grocery stores were labeled "values low prices." Those who ranked low prices as less important than first or second, were labeled "does not value low prices."

A Chi-square formula was used to test Hypothesis 1. The variables used were respondents who chose and did not choose lowest price stores, and respondents who valued and did not value low prices. The following Chi-square formula was used (Nie et al. 1975):
\[ x^2 = \sum_{i} \frac{(f_o^i - f_e^i)^2}{f_e^i} \]

Where:
- \( f_o^i \) = observed frequency per cell
- \( f_e^i \) = expected frequency calculated as
  \[ f_e^i = \left( \frac{c_i r_i}{N} \right) \]
- \( c_i \) = frequency in a respective column marginal
- \( r_i \) = frequency in a respective row marginal
- \( N \) = number valid cases

Hypothesis 2: Whether or not rural grocery shoppers identify low prices as first or second in importance in choosing a grocery store is independent of:

- a) sex,
- b) age,
- c) income,
- d) marital status,
- e) number in household,
- f) education of grocery shopper,
- g) employment status of grocery shopper, and
- h) Extension membership

Hypothesis 2 was tested to determine if there were any significant characteristics for those respondents who valued low prices. All 100 questionnaires were used for this test. The method for determining whether or not the respondent valued low prices was the same as in Hypothesis 1. Information on the respondents' characteristics was obtained from their answers to questions 2, 12-16, 19 and 20. The Chi-square test of independence described for Hypothesis 1 was also used to test Hypothesis 2.

Another Chi-square test (using the same variables described in Hypothesis 2) was performed on the 66 respondents who shopped the 14 stores priced. The sample of 66 was divided into two groups: those who chose and those who did not choose the lowest price stores (as determined in Hypothesis 1). The Chi-square test was used to identify
significant demographic characteristics of those shoppers who stated that low prices was the first or second most important characteristic of grocery stores.

Hypothesis 3: The number of major grocery shopping trips by shoppers not in the labor force is independent of the distance the shopper travels between home and the store.

Pearson's correlation coefficient was used to test Hypothesis 3 (Nie et al. 1975):

\[
 r = \frac{\sum_{i=1}^{N} (X_i - \overline{X})(Y_i - \overline{Y})}{\left\{ \left[ \sum_{i=1}^{N} (X_i - \overline{X})^2 \right] \left[ \sum_{i=1}^{N} (Y_i - \overline{Y})^2 \right] \right\}^{\frac{1}{2}}}
\]

Where: \( X_i \) = \( i^{th} \) observation of variable \( X \)

\( Y_i \) = \( i^{th} \) observation of variable \( Y \)

\( N \) = number of observations

\( \overline{X} \) = mean variable of \( X \)

\( \overline{Y} \) = mean variable of \( Y \)

To test the significance of the Pearson correlation coefficient, the following formula was used (Nie et al. 1975):

\[
t = r \sqrt{\frac{N-2}{1-r^2}}
\]

Where: \( r \) = correlation coefficient

\( N \) = number of observations

\( t \) = "t" test score
IV. FINDINGS AND DISCUSSION

The purpose of this study was to study the shopping practices of rural Oregon grocery shoppers. This research examines the decisions rural residents were making about choice of grocery stores, frequency of shopping, distance traveled, and value placed on low priced food market baskets. The discussion will be divided into the following general categories: differences in food prices at the grocery store, price knowledge of grocery shoppers, and driving costs.

Descriptive data were analyzed for all 100 respondents. Of those who responded to the questionnaire, 12 percent were male and 87 percent were female. Approximately 90 percent of the respondents were married, six percent widowed, and four percent divorced, single or other. The number of persons in the household ranged from one to more than eight, with the mean of 3.64 being higher than the national mean of 2.89 (United States Bureau of Census 1977) and the Oregon mean of 2.94 (Paulus). Over half of the sample (60 percent) had an education level of twelfth grade or less; 25 percent had two years of college; and 13 percent had four or more years of college.

One half of the respondents were not employed, while 19 percent were employed one to 20 hours per week, and 31 percent were employed outside the home 21 to 40 hours or more. Most of the respondents (87 percent) had never been members of an Extension study group, but of the group who had been members at some time, five respondents, or almost half, were currently members.

Approximately 57 percent of the respondents were 40 years old or less with more than one-third ranging in age from 31 to 40. Another 25 percent were over age 50. Thirty-three percent of the people (the largest category) reported a household income of over $20,000 annually, while almost one-fifth reported less than $7,500. Tables 2 and 3 provide
details of the age and income characteristics of the respondents. Additional demographic data can be found in Appendix D.

TABLE 2
Age Characteristics of 100 Grocery Shoppers, Scio, Oregon.

<table>
<thead>
<tr>
<th>Age</th>
<th>Percent of respondents*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Under 31</td>
<td>20</td>
</tr>
<tr>
<td>31 to 40</td>
<td>37.5</td>
</tr>
<tr>
<td>41 to 50</td>
<td>17</td>
</tr>
<tr>
<td>Over 50</td>
<td>24.5</td>
</tr>
<tr>
<td>Total</td>
<td>99.0</td>
</tr>
</tbody>
</table>

*Totals do not add to 100 because of rounding errors.

TABLE 3
Income Characteristics of 100 Grocery Shoppers, Scio, Oregon

<table>
<thead>
<tr>
<th>Income</th>
<th>Percent of respondents*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Under $7,500</td>
<td>19</td>
</tr>
<tr>
<td>$7,500 to 12,499</td>
<td>20</td>
</tr>
<tr>
<td>$12,500 to 19,999</td>
<td>27</td>
</tr>
<tr>
<td>Over $20,000</td>
<td>33</td>
</tr>
<tr>
<td>Total</td>
<td>99</td>
</tr>
</tbody>
</table>

*Totals do not add to 100 because of rounding errors.

Of the 100 questionnaires used in this study, 66 respondents shopped at one or more of the 14 stores priced. They had a mean weekly food expenditure of $51.95 with a range of $14 to $140. The remaining 34 respondents shopped at one or more of the 14 stores plus other stores and they had a mean weekly expenditure of $59.36 with a range of $2 to $220. The mean weekly grocery expenditure for all 100 respondents was $54.50.

Other descriptive demographic data were compiled for the 100 respondents: 33 percent of all respondents combined four or five of the last five grocery shopping trips with activities other than work, 43 percent of those employed outside the home shopped either on their way to
or from work, and 68 percent indicated they raised some food for their own consumption. These measures may be efforts at conserving gasoline, personal energy, time, or money.

Differences in Food Prices at the Grocery Stores

Fourteen Stores

Prices of the market basket items were gathered weekly for four weeks at 14 stores. In order to compare market basket prices at each of the 14 stores, butchered meats were eliminated from the market basket. This resulted in a 56 item market basket. The mean weighted and unweighted market basket price for 14 stores (identified as Stores A–N) and store ranks are shown in Table 4. The mean price of the weighted market basket for each of the 14 stores ranged from $67.51 to $82.36, or a difference of $14.85. The mean price of the weighted market basket for all 14 stores was $74.02. The mean price of the unweighted market basket ranged from $43.31 to $51.98, or a difference of $8.67. The mean price of the unweighted market basket for all 14 stores was $48.34. Six of the 14 stores did not vary in ranking by price whether weighted or unweighted. All other stores varied one or two places by rank.
TABLE 4
Four Week Mean, Weighted and Unweighted Market Basket Price and Store Rank for 56 Items at 14 Grocery Stores.

<table>
<thead>
<tr>
<th>Area</th>
<th>Store</th>
<th>Weighted Market Basket Price</th>
<th>Rank</th>
<th>Unweighted Market Basket Price</th>
<th>Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>Albany</td>
<td>A</td>
<td>$70.95</td>
<td>3</td>
<td>$47.58</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>B</td>
<td>67.51</td>
<td>1</td>
<td>43.31</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>C</td>
<td>74.52</td>
<td>10</td>
<td>48.95</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td>D</td>
<td>74.25</td>
<td>9</td>
<td>49.50</td>
<td>11</td>
</tr>
<tr>
<td></td>
<td>E</td>
<td>71.91</td>
<td>4</td>
<td>47.30</td>
<td>3</td>
</tr>
<tr>
<td>Salem</td>
<td>F</td>
<td>72.88</td>
<td>5</td>
<td>47.71</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>G</td>
<td>73.43</td>
<td>6</td>
<td>48.13</td>
<td>7</td>
</tr>
<tr>
<td></td>
<td>H</td>
<td>68.61</td>
<td>2</td>
<td>45.10</td>
<td>2</td>
</tr>
<tr>
<td>Stayton</td>
<td>I</td>
<td>73.56</td>
<td>7</td>
<td>47.99</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>J</td>
<td>76.04</td>
<td>11</td>
<td>49.78</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td>K</td>
<td>73.84</td>
<td>8</td>
<td>48.26</td>
<td>8</td>
</tr>
<tr>
<td>Scio</td>
<td>L</td>
<td>77.00</td>
<td>12</td>
<td>49.23</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>M</td>
<td>79.48</td>
<td>13</td>
<td>51.97</td>
<td>13</td>
</tr>
<tr>
<td></td>
<td>N</td>
<td>82.36</td>
<td>14</td>
<td>51.98</td>
<td>14</td>
</tr>
</tbody>
</table>

Mean price

$74.02 $48.34

1 = lowest price; 14 = highest price

The maximum difference in the mean market basket price among stores by area is shown in Table 5.

TABLE 5
Maximum Difference in Mean Market Basket Price Among Stores by Area.

<table>
<thead>
<tr>
<th>Area</th>
<th>Mean* Weighted Market Baskets</th>
<th>Mean* Unweighted Market Baskets</th>
</tr>
</thead>
<tbody>
<tr>
<td>Albany</td>
<td>$7.01</td>
<td>$3.99</td>
</tr>
<tr>
<td>Salem</td>
<td>4.82</td>
<td>3.03</td>
</tr>
<tr>
<td>Stayton</td>
<td>2.48</td>
<td>1.79</td>
</tr>
<tr>
<td>Scio</td>
<td>5.36</td>
<td>2.75</td>
</tr>
</tbody>
</table>

*Mean is the average of four weekly market basket prices.
Rank of stores within each of four areas by mean price of weighted and unweighted market basket is shown in Table 6. The rankings of the weighted and unweighted market baskets remained the same for the areas of Salem, Stayton, and Scio. However, for the Albany area, the rankings varied somewhat for all stores except Store B.

### TABLE 6

Rank of 14 Stores in Four Areas by the Four Week Mean Price of Weighted and Unweighted Market Basket, 56 Items.

<table>
<thead>
<tr>
<th>Area</th>
<th>Store</th>
<th>Weighted Market Basket</th>
<th>Unweighted Market Basket</th>
</tr>
</thead>
<tbody>
<tr>
<td>Albany</td>
<td>F</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>G</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>H</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Salem</td>
<td>I</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>J</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>K</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Stayton</td>
<td>L</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>M</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>N</td>
<td>3</td>
<td>3</td>
</tr>
</tbody>
</table>

1 = lowest price; 5 = highest price

**Eleven Stores**

A more representative picture of grocery prices necessitates including meat prices in the market basket. To do this, Stores B, L, and N are deleted from the analysis. Table 7 presents the mean weighted and unweighted prices and store ranks for the 87 item market basket at 11 stores. The price of the mean weighted market basket ranged from
$113.32 to $123.76, or a difference of $10.44. The mean unweighted market basket price ranged from $85.48 to $92.66, or a difference of $7.18. Six stores (those ranking 1, 2, 3, 4, 7, and 11) did not vary according to whether the market basket was weighted or unweighted. However, Store K was ranked 10 by the weighted and 5.5 by the unweighted market basket, indicating that items with larger weights in the family food budget were priced higher, compared to other stores. Stores C and G were ranked three places lower when weighted than when unweighted. This indicates items with large weights were lower priced, compared to other stores.

**TABLE 7**

Four Week Mean, Weighted and Unweighted Market Basket Price and Store Rank for 87 Items at 11 Stores.

<table>
<thead>
<tr>
<th>Area</th>
<th>Store</th>
<th>Weighted Market Basket Cost</th>
<th>Rank</th>
<th>Unweighted Market Basket Cost</th>
<th>Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>Albany</td>
<td>A</td>
<td>$115.49</td>
<td>2</td>
<td>$87.65</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>C</td>
<td>120.93</td>
<td>5</td>
<td>91.57</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>D</td>
<td>121.37</td>
<td>9</td>
<td>92.44</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>E</td>
<td>119.19</td>
<td>3</td>
<td>90.05</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>F</td>
<td>120.28</td>
<td>4</td>
<td>90.48</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>G</td>
<td>121.15</td>
<td>6</td>
<td>92.22</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td>H</td>
<td>113.32</td>
<td>1</td>
<td>85.48</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>I</td>
<td>121.15</td>
<td>7</td>
<td>91.13</td>
<td>7</td>
</tr>
<tr>
<td></td>
<td>J</td>
<td>123.76</td>
<td>11</td>
<td>92.66</td>
<td>11</td>
</tr>
<tr>
<td></td>
<td>K</td>
<td>121.58</td>
<td>10</td>
<td>90.92</td>
<td>5.5</td>
</tr>
<tr>
<td></td>
<td>M</td>
<td>121.37</td>
<td>8</td>
<td>90.92</td>
<td>5.5</td>
</tr>
</tbody>
</table>

Mean Price

| $119.96 | $90.50 |

1 = lowest price; 11 = highest price
Rank of 11 stores in four areas by mean price of weighted and unweighted market basket is shown in Table 8. The rankings of weighted and unweighted market basket prices for the areas of Albany, Salem and Scio remained the same. The Stayton area was the only area which varied.

**TABLE 8**

*Rank of 11 Stores in Four Areas by the Four Week Mean Price of Weighted and Unweighted Market Basket, 87 Items*

<table>
<thead>
<tr>
<th>Area</th>
<th>Store</th>
<th>By Weighted Market Basket</th>
<th>By Unweighted Market Basket</th>
</tr>
</thead>
<tbody>
<tr>
<td>Albany</td>
<td>A</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>C</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>D</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>E</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Salem</td>
<td>F</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>G</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>H</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Stayton</td>
<td>I</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>J</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>K</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Scio</td>
<td>M</td>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>

1 = lowest price; 4 = highest price
The range in prices between the highest and lowest price market baskets was calculated. The values are listed in Table 9.

**TABLE 9**  
Range in Prices Between Weighted and Unweighted Market Baskets.

<table>
<thead>
<tr>
<th>Market Basket</th>
<th>Number of Stores</th>
<th>Number of Items</th>
<th>Difference Between Highest and Lowest Priced Market Basket</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weighted</td>
<td>14</td>
<td>56</td>
<td>$14.85</td>
</tr>
<tr>
<td>Unweighted</td>
<td>14</td>
<td>56</td>
<td>8.67</td>
</tr>
<tr>
<td>Weighted</td>
<td>11</td>
<td>87</td>
<td>10.44</td>
</tr>
<tr>
<td>Unweighted</td>
<td>11</td>
<td>87</td>
<td>7.18</td>
</tr>
</tbody>
</table>

Using mean weighted prices for 14 stores (the 56 item market basket), the lowest priced market basket of goods was computed for each area. The lowest priced basket was obtained by shopping all the stores in one area. The lowest total price per area was: Albany, $65.05; Salem, $66.17; Stayton, $71.21; and Scio, $72.23. The savings by shopping all stores in an area versus shopping the lowest price single store ranged from $2.35 in Stayton to $4.77 in Scio. If a person were to shop all 14 stores for the lowest priced items, a $62.88 market basket would result (compared to $82.36 for the highest price paid at any one store). Table 10 presents data indicating the savings and percentage savings possible in the market basket of goods by shopping the group of stores versus shopping a single store in each area.

An analysis of variance was used to determine if a significant difference existed among the mean prices of market baskets by weeks and by stores. The results of the test are shown in Table 11.
TABLE 10

Lowest Price Weighted Market Basket and Savings Possible by Shopping all Stores in an Area*

<table>
<thead>
<tr>
<th>Area</th>
<th>Store</th>
<th>Store Market Basket Price</th>
<th>Area Lowest Market Basket</th>
<th>Savings Possible</th>
<th>Percent Savings Possible</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>A</td>
<td>$70.95</td>
<td>$65.05</td>
<td>$5.90</td>
<td>8.3</td>
</tr>
<tr>
<td></td>
<td>B</td>
<td>67.51</td>
<td>65.05</td>
<td>2.46</td>
<td>3.6</td>
</tr>
<tr>
<td>Albany</td>
<td>C</td>
<td>74.52</td>
<td>65.05</td>
<td>9.47</td>
<td>12.7</td>
</tr>
<tr>
<td></td>
<td>D</td>
<td>74.25</td>
<td>65.05</td>
<td>9.20</td>
<td>12.4</td>
</tr>
<tr>
<td></td>
<td>E</td>
<td>71.91</td>
<td>65.05</td>
<td>6.86</td>
<td>9.5</td>
</tr>
<tr>
<td></td>
<td>F</td>
<td>72.88</td>
<td>66.17</td>
<td>6.71</td>
<td>9.2</td>
</tr>
<tr>
<td>Salem</td>
<td>G</td>
<td>73.43</td>
<td>66.17</td>
<td>7.26</td>
<td>9.9</td>
</tr>
<tr>
<td></td>
<td>H</td>
<td>68.61</td>
<td>66.17</td>
<td>2.44</td>
<td>3.6</td>
</tr>
<tr>
<td></td>
<td>I</td>
<td>73.56</td>
<td>71.21</td>
<td>2.35</td>
<td>3.2</td>
</tr>
<tr>
<td>Stayton</td>
<td>J</td>
<td>76.04</td>
<td>71.21</td>
<td>7.26</td>
<td>6.4</td>
</tr>
<tr>
<td></td>
<td>K</td>
<td>73.84</td>
<td>71.21</td>
<td>2.44</td>
<td>3.6</td>
</tr>
<tr>
<td></td>
<td>L</td>
<td>77.00</td>
<td>72.23</td>
<td>4.77</td>
<td>6.2</td>
</tr>
<tr>
<td>Scio</td>
<td>M</td>
<td>79.48</td>
<td>72.23</td>
<td>7.25</td>
<td>9.1</td>
</tr>
<tr>
<td></td>
<td>N</td>
<td>82.36</td>
<td>72.23</td>
<td>10.13</td>
<td>12.3</td>
</tr>
</tbody>
</table>

Lowest 14 store market basket price = $62.88

* Based on the mean of four weeks of market basket prices, 56 items.
TABLE 11

Analysis of Variance of Mean Prices of Market Basket by Weeks and by Stores, Weighted and Unweighted Baskets, 11 and 14 Stores.

<table>
<thead>
<tr>
<th>Basket</th>
<th>Stores No.*</th>
<th>Variable</th>
<th>Sum of Squares</th>
<th>df</th>
<th>F</th>
<th>Significance of F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weighted</td>
<td>11</td>
<td>weeks</td>
<td>.001</td>
<td>3</td>
<td>1.126</td>
<td>.354</td>
</tr>
<tr>
<td>Weighted</td>
<td>11</td>
<td>stores</td>
<td>.047</td>
<td>10</td>
<td>11.507</td>
<td>.001**</td>
</tr>
<tr>
<td>Unweighted</td>
<td>11</td>
<td>weeks</td>
<td>.000</td>
<td>3</td>
<td>.237</td>
<td>.870</td>
</tr>
<tr>
<td>Unweighted</td>
<td>11</td>
<td>stores</td>
<td>.025</td>
<td>10</td>
<td>10.295</td>
<td>.001**</td>
</tr>
<tr>
<td>Weighted</td>
<td>14</td>
<td>weeks</td>
<td>.001</td>
<td>3</td>
<td>.801</td>
<td>.501</td>
</tr>
<tr>
<td>Weighted</td>
<td>14</td>
<td>stores</td>
<td>.264</td>
<td>13</td>
<td>77.085</td>
<td>.001**</td>
</tr>
<tr>
<td>Unweighted</td>
<td>14</td>
<td>weeks</td>
<td>.001</td>
<td>3</td>
<td>1.847</td>
<td>.155</td>
</tr>
<tr>
<td>Unweighted</td>
<td>14</td>
<td>stores</td>
<td>.091</td>
<td>13</td>
<td>35.123</td>
<td>.001**</td>
</tr>
</tbody>
</table>

* The 11 store group had 87 items in the market basket and the 14 store group had 56 items in the market basket.

**Value indicates significance.

A significant difference existed among the mean market basket prices by stores, but not by weeks. Food prices did not rise significantly among weeks. Also, the specials included by identity in the market basket had a similar impact on the market basket prices each week so that the inclusion of specials in market basket prices did not affect the overall rating of the store on a week by week basis. The specials referred to in this case are identical to the items regularly priced and did not require a shift in brand or size.

Special Savings

Where the exact size and brand item being priced was reduced in price at the time of data gathering, the lower price was recorded. A notation was made of a reduced price of the same item, same size, but different brand. Four
stores had no special savings for similar brands during the weeks priced. The mean savings at the other ten stores ranged from one cent per week to 92.5 cents per week. The mean weekly savings per store was 21.2 cents.

**Price Knowledge of Grocery Shoppers**

Hypothesis 1 states: Rural grocery shopper's selection of low priced stores is independent of whether or not they value low prices.

To test Hypothesis 1, a total score was derived for the 66 respondents shopping at one or more of the 14 stores priced. The total score was the sum of the percentage of the previous week's food budget spent at each store multiplied by the store's weighted value. (Weighted value for each store was the mean market basket price as a percentage of the lowest priced store's mean price.) The total scores ranged in value from 1.000 to 1.1698. The mean value of the respondents' total scores was 1.0969 and the median score was 1.0932. The median score was used to divide the respondents into two groups. These groups were labeled "choosing lowest price stores" and "not choosing lowest price stores".

The importance of low prices to respondents was reviewed. The questionnaire listed ten characteristics of grocery stores and asked the respondents to rank the five characteristics most important to the respondent. If the respondent indicated low prices as first or second most important, the respondent was included in the group that "value low prices". Forty-six percent of all 100 respondents and 45 percent of the 66 respondents shopping all 14 stores ranked low prices first or second.

The observed values for the cells of the Chi-square table are shown in Table 12. Of the 66 respondents examined, 12 gave insufficient data to be included in this test. As
a result, 54 respondents were used in testing Hypothesis I.

TABLE 12
Comparison of Respondents' Attitude Toward the Importance of Low Prices and Their Choice of Lowest Price Stores.

<table>
<thead>
<tr>
<th>Respondents choosing lowest price stores</th>
<th>Respondents not choosing lowest price stores</th>
</tr>
</thead>
<tbody>
<tr>
<td>Respondents Valuing Low Prices</td>
<td>Respondents not Valuing Low Prices</td>
</tr>
<tr>
<td>19</td>
<td>8</td>
</tr>
<tr>
<td>27</td>
<td>27</td>
</tr>
<tr>
<td>10</td>
<td>17</td>
</tr>
<tr>
<td>10</td>
<td>17</td>
</tr>
<tr>
<td>29</td>
<td>25</td>
</tr>
<tr>
<td>29</td>
<td>25</td>
</tr>
<tr>
<td>54</td>
<td>54</td>
</tr>
</tbody>
</table>

\[ X^2 = 6.03*; \ df = 1; \ probability = .05 \]

*Significant at .05 level.

Hypothesis I was rejected, indicating that rural grocery shoppers who select lowest price stores are those who value low prices. This would support Brown's conclusion (1968) that price conscious shoppers are the most valid perceivers of grocery store prices. The respondents in this study have sufficient price information for those shoppers who value low prices to differentiate among the price levels of the stores.

Hypothesis 2 states: Whether or not rural grocery shoppers identify low prices as first or second in importance in choosing a grocery store is independent of:

- sex,
- age,
- income,
- marital status,
- number in household,
- education of the grocery shopper,
- employment status of grocery shopper, and
- Extension membership.
The Chi-square test of independence with a continuity correction for small frequencies was used to identify the significant demographic characteristics of rural grocery shoppers who value low prices as an important characteristic of grocery stores. None of the characteristics investigated (sex, age, marital status, number in household, education of grocery shopper, employment status of grocery shopper, and Extension membership) was significant in any of the four groups of respondents examined:

1) all 100 respondents,
2) 66 respondents shopping the 14 stores priced,
3) 27 respondents who selected lowest price market baskets as determined in Hypothesis 1, and
4) 27 respondents who did not select lowest price market baskets as determined in Hypothesis 1.

Appendix E lists the Chi-square values for the demographic characteristics of grocery shoppers who identify and do not identify low prices as first or second in importance in choosing a grocery store. Hypothesis 2 was retained: whether or not rural grocery shoppers identify low prices as first or second in importance in choosing a grocery store is independent of the demographic variables.

Driving Costs

Distance to Stores

The one-way distance from the store to home, or from the store to work for those employed, was examined. The mean distance for the 66 respondents who shopped exclusively at one or more of the 14 stores priced was 10.2 miles. For the 34 respondents who listed any stores not priced the mean distance was 12.8 miles. For all 100 respondents the mean distance was 11.2 miles.
**Frequency of Trips**

Hypothesis 3 states: The number of major grocery shopping trips by shoppers not in the labor force is independent of the distance the shopper travels between home and the store.

Pearson's correlation coefficient was used to determine the relationship between the number of grocery shopping trips and the mean distance to the store for those shoppers not employed outside the household. Of the 100 respondents, 50 were not employed. The responses of these 50 respondents were used to test this hypothesis.

A correlation was run between the number of trips made to the grocery store by the shoppers and the mean distance to the store from home. The correlation coefficient was -0.4536. The significance of the correlation coefficient was tested, with a .05 level chosen as significant. A "t" score of 3.5263 was calculated and found to be significant at the .05 level. Data used in the computation of Pearson's correlation coefficient are in Appendix F.

The hypothesis that number of trips is independent of distance is rejected. The number of trips is negatively associated with distance. This result reinforces the findings of Bishop and Brown (1969) and Brown (1978). However, this research indicates a statistically significant relationship where Bishop's results were not statistically significant.

Employment status affects the number of trips made to the grocery store. For those employed any number of hours outside the household, the mean number of trips was 3.51 per week. For those respondents not employed outside the household, the mean number of trips per week was 3.18. This would appear to support the Walker and Woods study (1976) stating that employed homemakers shop more frequently than those not employed outside the household. These data do
not agree with the Hacklander (1978b) or the ERS survey (United States Department of Agriculture 1976b) findings that shopping once a week is representative of most shoppers.

**Number of Stores Shopped**

Whether or not a respondent ranked low prices as highest priority was unrelated to the number of stores shopped. The mean number of stores for those shoppers identifying low prices as first or second in importance in choosing a grocery store was 2.76 stores; for those not identifying low prices first or second, the mean was 2.95 stores. These data support the rejection of Hypothesis I. Shoppers who valued low prices were better able to select low price stores, and those shoppers who value low prices did not simply select the low priced items at a large number of stores, but fulfilled their values by selecting low priced stores.

Hacklander (1978b) wrote that shoppers use more than one but less than two stores per week. The ERS survey (United States Department of Agriculture 1976b) indicated shoppers used only one store per week. Cunningham (1966) reported that 48.6 percent of the family's food purchases are made at its favorite store. Crowell (1977) concluded that to achieve the lowest cost market basket within a five mile area, including cost of time and transportation, shopping two stores resulted in the lowest cost market basket 75 percent of the time. Lifquist (1965) stated that if a person shopped the best prices at two stores, a ten percent savings would result over shopping national brands at only one store.
It would appear from the literature that shopping more than one store may be economical for grocery shoppers if time and transportation costs are minimal. If rural shoppers' costs of time and transportation are low enough, they would benefit from shopping more than one store to achieve a low priced market basket.

Discussion of the Findings

Rural grocery shoppers need to evaluate several variables when determining the number of stores to shop. Table 13 illustrates the advantage of shopping at more than one store when considering only the price of the market basket.

The mean percentage savings by shopping the lowest price combination of three stores in an area over shopping the lowest price single store is 4.10 percent. The mean percentage savings of shopping the lowest price combination of three stores in an area over shopping the highest price single store is 10.27 percent. The implications that this has for a family of four is shown in Table 14.
TABLE 13
Percentage Savings in Shopping Lowest Price Combination of Three Stores Per Area and Highest and Lowest Price Stores

<table>
<thead>
<tr>
<th>Town</th>
<th>Lowest Price Combination Three Stores (A)</th>
<th>Lowest Price Single Store (B)</th>
<th>Difference (B-A) (C)</th>
<th>Savings (C/B)</th>
<th>Highest price Single Store (D)</th>
<th>Difference (D-A) (E)</th>
<th>Savings (E/D)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Albany</td>
<td>$65.19</td>
<td>$67.51</td>
<td>2.32</td>
<td>(3.44)</td>
<td>$74.52</td>
<td>9.33</td>
<td>(12.52)</td>
</tr>
<tr>
<td>Salem</td>
<td>$66.17</td>
<td>$68.61</td>
<td>2.44</td>
<td>(3.56)</td>
<td>$73.43</td>
<td>7.26</td>
<td>(9.89)</td>
</tr>
<tr>
<td>Stayton</td>
<td>$71.21</td>
<td>$73.56</td>
<td>2.35</td>
<td>(3.19)</td>
<td>$76.04</td>
<td>4.83</td>
<td>(6.35)</td>
</tr>
<tr>
<td>Scio</td>
<td>$72.23</td>
<td>$77.00</td>
<td>4.77</td>
<td>(6.19)</td>
<td>$82.36</td>
<td>10.13</td>
<td>(12.30)</td>
</tr>
</tbody>
</table>

Mean Savings, %
(4.10) (10.27)
### TABLE 14

Annual Savings by Shopping Lowest Price Combination of Three Stores in an Area, Based on Market Basket Savings.

<table>
<thead>
<tr>
<th>Level of Living</th>
<th>Annual Cost of Food at Home for 4-Person Family, Autumn 1977*</th>
<th>Mean Annual Savings of Shopping Three Stores over:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Lowest Price Single Store at Mean 4.10% Savings</td>
</tr>
<tr>
<td>Lower</td>
<td>$2,630</td>
<td>$107.83</td>
</tr>
<tr>
<td>Intermediate</td>
<td>3,190</td>
<td>130.79</td>
</tr>
<tr>
<td>Higher</td>
<td>3,841</td>
<td>157.48</td>
</tr>
</tbody>
</table>

* Families living in western United States in towns with population 2,500 to 50,000 (United States Department of Labor 1978a).
Number of Stores to Shop

The range of savings by shopping the lowest price combination of stores in an area compared to any single store is $2.35 to $10.13 per market basket. To minimize the price of the market basket, time and transportation costs should not exceed the value of the savings of shopping stores more distant or lower in price.

A 1978 compact car costs 15.9 cents per mile to operate in rural areas. If the value of time is zero, a total of from 14.8 to 63.7 miles could be driven round trip in a 1978 compact car for the stores studied in order to fill a low price market basket. As the value of time increases, the number of miles must decrease in order to keep time and transportation costs less than the value of savings from shopping additional stores.

Rural shoppers can determine the number of stores appropriate to shop with knowledge of the following variables: (a) value of shopper's time (in cents per minute), (b) amount of time to shop and drive to an additional store (in minutes), (c) cost per mile to operate vehicle (in cents), (d) total miles for driving to an additional store, and (e) savings by shopping an additional store (in cents). If \( S(abc + cd) < e \), then it is economical to shop this additional store.

Below is a formula for assessing the value of time for shopping an additional store:

\[
Y = 60 \left[ \frac{S-DC}{T} \right]
\]

Where

- \( S = \) amount in dollars of market-basket savings for shopping one more store,
- \( D = \) distance to store in miles,
- \( C = \) vehicle operating cost in dollars per mile,
- \( T = \) number of additional minutes to shop and drive to additional store, and
- \( Y = \) value of shopper's time for shopping additional store in dollars per hour.
If the value of time associated with shopping an additional store is greater than the value the shopper places on his or her time, then the additional store should be shopped.
Summary and Conclusions

Food consumed at home represents a large portion of the family budget, approximately 18.6 percent (United States Department of Labor 1978b). For rural residents, the costs of obtaining a market basket of food may be higher than for their urban counterparts, as costs of time and transportation to secure the market basket may be greater. This study examines the grocery shopping practices and the stores shopped by the rural grocery shoppers.

The following hypotheses were tested:

1) Rural grocery shoppers' selection of low priced stores is independent of whether or not they value low prices.

2) Whether or not rural grocery shoppers identify low prices as first or second in importance in choosing a grocery store is independent of:
   a) sex,
   b) age,
   c) income,
   d) marital status,
   e) number in household,
   f) education of grocery shopper,
   g) employment status of grocery shopper, and
   h) Extension membership.

3) The number of major grocery shopping trips by shoppers not in the labor force is independent of the distance the shopper travels between home and the store.

A questionnaire was designed and sent to 259 randomly chosen rural families. One hundred usable questionnaires were returned with information on which stores were patronized, distance between store and home (and work), amount of money spent at each store, number of trips made, number of trips combined with other activities, amount of food raised for personal consumption, and demographic characteristics of the grocery shopper.

From the information received on the questionnaires, 14 grocery stores in four towns were identified as those most frequently patronized by the shopper sample.
item market basket was priced for four weeks at the 14 stores. Six of the 93 items were frequently missing from the grocers' shelves during the pricing period. These items were eliminated from the market basket. As three stores consistently lacked butchered meats, a method was devised to allow comparison of mean market basket prices of the stores. Two market baskets were established: a 56 item "meatless" basket to compare all 14 stores, and an 87 item market basket for comparison of the 11 stores with a full meat line. The market basket items at all stores were weighted to reflect the importance of the items in a family budget. Most of the 14 stores retained their relative positions when ranked by weighted and unweighted prices. Three stores shifted three or more rankings up or down when market baskets included meat prices, indicating their meat prices were either higher or lower relative to the other stores.

Tests were run to determine the significant difference between stores and between weeks. Differences in mean market basket prices by stores were significant; however, differences in prices by weeks were not significant.

A lowest price weighted market basket was computed for each area and for all 14 stores. Shopping the maximum number of stores priced in an area (either three or five, depending on town), yielded the lowest price market basket for that town. For 12 of the 14 stores, shopping one less than maximum (two or four stores depending on town), yielded a lower price market basket than shopping any single store. The mean savings by shopping all stores in an area priced in this study versus shopping the lowest price single store in an area was $3.00 (using a weighted market basket). A model was designed to facilitate deciding the number of stores to shop to acquire the lowest price market basket:

If \( \sum (ab + cd) < e \), then it is economical to shop an additional store.
Where:  
\[ a = \text{value of shopper's time (in cents per minute)}, \]
\[ b = \text{amount of time to shop and drive to an additional store (in minutes)}, \]
\[ c = \text{cost per mile to operate vehicle (in cents)}, \]
\[ d = \text{total miles for driving to an additional store}, \]
\[ e = \text{savings by shopping an additional store (in cents)}. \]

Each of the 66 respondents shopping the 14 stores was assigned a score representing the shopper's degree of use of each store. These scores and whether or not the shoppers selected low prices as an important characteristic of stores were used to test the first hypothesis. Grocery shoppers who ranked low prices as first or second were more likely to select low price stores than those shoppers who did not select low prices as first or second priority.

Data from all 100 respondents were examined by selected demographic characteristics to further describe those respondents who were valuing low prices and who were also selecting lowest price stores. No significant demographic variables were identified upon testing Hypothesis 2. Many of the respondents were concerned with saving money on their food budgets: 46 percent ranked low prices first or second priority, 33 percent combined four or five of the last five major grocery shopping trips with activities other than work, 19 percent frequently shopped either on their way to or from work, and 68 percent raised some of their own food.

For Hypothesis 3, the frequency of trips to the store and the relationship of frequency to distance from the store were examined for homemakers not employed outside the home (50 percent of the sample). The number of grocery shopping trips was negatively associated with the mean distance from home to store. Those respondents employed outside the household made 3.51 trips to the store per week whereas those not
employed made 3.18 trips per week. The number of stores shopped was unrelated to whether or not the shopper valued low prices. Those shoppers valuing low prices shopped 2.76 stores. For those not valuing low prices, the mean was 2.95 stores per week.

The mean one-way distance from the store to home (or from the store to work for those employed) was 10.2 miles for those respondents shopping exclusively at one or more of the 14 stores priced. For those respondents shopping any other combination of stores, the mean distance was 12.8 miles. A possible explanation for this difference could be that those persons shopping the 14 stores priced either lived or worked closer to the stores they patronized than those persons shopping other stores. The mean distance to the store for all 100 respondents was 11.2 miles.

Recommendations

There are a number of reasons shoppers give for patronizing special stores: cleanliness, crowdedness, low prices, large selection, proximity to home or work, store loyalty, etc. Since values affect decisions, shoppers need to determine their values in relation to grocery shopping and saving money.

Consumer educators such as Extension personnel can use the models developed in this study to help shoppers determine a shopping pattern that fits their needs and values. Shoppers can be made aware of the effects of time and transportation costs on total market basket price. Such knowledge should lead to a reassessment of shopping behavior and better decisions in the market place.

Grocery store managers might use the results of this study to increase sales volume. Knowing that low grocery
prices influence shopping behavior, aggressive managers would accommodate the customers with the low prices they want.

Question 9 on the study questionnaire (Appendix A) was a problem for many respondents. Researchers trying to obtain information dealing with the value of home food production should redesign the question. Question 4 asks for dollar amount spent for groceries for a specific week. To use the data as they were used in this study, the amount typically spent at each store needed to be recorded to avoid dropping those respondents from the study who bought no groceries for the specific week.

Further research needs to be done to compare rural and urban shoppers, i.e.: Are rural shoppers more concerned with low prices than urban shoppers? Which group spends more money per capita on groceries? Do rural shoppers make fewer trips to the grocery store than their urban counterparts? Research also needs to be done to determine if the price relationship between stores is constant over longer periods of time. Information of these types would facilitate the consumer educator's job of informing rural shoppers about the market in which they must make decisions.

Conclusions

The following conclusions apply to the rural grocery shoppers of Scio, Oregon:

1) grocery store shoppers who value low prices are able to select grocery stores with low priced groceries;

2) a model taking time and transportation costs into account can be used to assess the costs of grocery shopping; and

3) the number of grocery shopping trips made by a shopper is inversely related to the distance the shopper lives from the stores selected for shopping.


________. "Do Working Wives Shop Differently for Food?" National Food Review, April 1978b, pp. 20-23.


Sproles, George B; Geistfeld, Loren V.; and Badenhop, Suzanne B. "Information Inputs as Influences on Efficient Consumer Decisions." Journal of Consumer Affairs 12 (Summer 1978): 88-103.


APPENDICES
Dear Scio Grocery Shopper:

The Linn County Extension Service and the School of Home Economics at Oregon State University are studying the shopping patterns of rural grocery shoppers. The results of this study should help the Extension Service tailor educational programs for rural homemakers.

We need your help. There are not enough funds to contact all rural families in Scio, so only a few have been selected. Your name was chosen by scientific methods and your response is an essential part of our cross section. There is no way we can substitute for the answers only you, yourself, can give.

It would be most helpful if the person doing the food shopping in your household would fill out the enclosed questionnaire. This should take about 15 minutes. We would like to receive your questionnaire as soon as possible. Remove the cover letter and send the questionnaire in the enclosed envelope. No stamp is necessary.

A final note. The questionnaire is numbered so reminders may be sent, if necessary, without further imposing on those who have completed and returned the questionnaire. The information gathered will remain confidential and in no way will your responses be linked to your name.

If you have questions concerning this questionnaire, please call the Linn County Extension Service at 967-3871.

Thank you for your courtesy and help.

Sincerely,

Prepared by:
Janice E. Amling
Graduate Student
Family Resource Management Department

Gloria O. Shibley
Home Economics Extension Agent
Linn County Extension Service
April 20, 1978

Dear Scio Grocery Shopper:

We really need your help. We haven't received enough responses to the last grocery shopping questionnaire to get an accurate idea of how often and where the residents of Scio shop. If you have not already sent in a questionnaire, we wish you would consider taking 15 minutes to fill out this form.

It would be most helpful if the person doing the food shopping in your household would fill out the questionnaire. We would like to receive your questionnaire as soon as possible. Remove this cover letter and send the questionnaire in the enclosed envelope. No stamp is necessary. The information you send will remain confidential and in no way will your responses be linked to your name.

If you have questions concerning this questionnaire, please call the Linn County Extension Service at 967-3871.

Thank you for your courtesy and help.

Sincerely,

Prepared by:
Janice E. Amling
Graduate Student
Family Resource Management Department
Oregon State University

Gloria O. Shibley
Home Economics Extension Agent
Linn County Extension Service.
This form is to be filled out by the person in the household who does the major grocery shopping.

1. List the stores where you typically do your major grocery shopping in the left-hand column. Check across the row those types of food you purchase at each store.

<table>
<thead>
<tr>
<th>STORES</th>
<th>TOWN</th>
<th>BREAD, CEREAL</th>
<th>MEAT, Poultry</th>
<th>FISH</th>
<th>DAIRY PRODUCTS</th>
<th>FRUITS, VEGETABLES</th>
<th>OTHER FOOD ITEMS: sugar, oil, flour, etc.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

2. Are you employed? Yes __; No __. Hours you work per week __. Town where you are employed __. Do you shop either on your way to or from work? Frequently __; Sometimes __; Never __.

3. Think about the last five times you did major grocery shopping. How many trips did you combine with activities other than work? ____ List the activities:

Is this typical? Yes ____; No ____. What is the major reason for combining activities? Rank the following, 1 for most important, 2 for less important, and 3 for least important reason. Gas ____; Time ____; Personal energy ____.  

4. Again list the stores where you do your major grocery shopping in the left-hand column. Fill in the numbers asked for across the rows (as best you can recall.)

<table>
<thead>
<tr>
<th>STORES</th>
<th>TOWN</th>
<th># TIMES SHOPPED THERE LAST WEEK</th>
<th>AMOUNT OF MONEY SPENT THERE LAST WEEK</th>
<th># MILES FROM HOME</th>
<th># MILES DRIVEN OUT OF YOUR WAY TO GET THERE (FROM WORK)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

5. How much do you typically spend on food from all grocery and specialty stores? Fill in either blank: $_______ per week; $_______ per month.

6. If the stores listed in #4 above do not include any from Albany, why don't you shop in Albany? ___________________________________________________________________________

7. If the stores listed in #4 above do not include any from Scio, why don't you shop in Scio? ___________________________________________________________________________

8. Do you raise food for your own consumption? (ie. meat, chicken, produce, eggs, milk, etc.) Yes __; No __.
9. Of the total value of food your household consumes, what is the approximate total annual market value of foods produced at home, bought at a food locker, procured through hunting or fishing efforts? (Foods not included in #5 above.)
$ ___________ (per year)

10. Among the stores that you shop, what are your reasons for shopping there? Below are listed 10 qualities of grocery stores. Cross out those qualities unimportant to you and add your favorites. Then rank the five qualities you value most, giving 1 to the most important, 2 to the next important, 3 to the third most important quality listed, etc.

- Good dairy department
- Good meat department
- Shelves usually well stocked
- Low prices
- All prices clearly labeled
- Other (specify): ____________________
- Good parking facilities
- Convenient store location
- Accurate, pleasant checkout clerks
- Good produce department
- Cleanliness

11. List the days of the week you grocery shop ____________________________;
   Time ____________________________.

12. What is your age? (Check one)

   Under 21 ________ 21-25 ________ 26-30 ________ 31-40 ________ 41-50 ________
   51-60 ________ Over 60 ________

13. What is your sex? Male: Female: ____________________

14. Check the level which represents the highest grade you completed in school:

   Grade school ________ 2 year college or vocational school ________
   Junior high ________ 4 year college ________
   High school ________ Graduate school ________

15. Present marital status: Married: Widowed: Divorced: Single: Other: ____________________

16. Number of people residing in your household: ____________________

17. Type of car usually used for grocery shopping: (Check one) Standard: Compact: Subcompact: ____________________

18. Location of your residence (i.e. 5 miles SE of Scio) ____________________

19. Have you been a member of an Extension study group? Yes: No: 
   Number of years you have been a member: ________ Are you a member now? Yes: No: ________

20. What is the total of the combined incomes before taxes for the heads of your household? (Include such payments to you as ADC, Social Security, Food Stamps, etc.)

   Under $3,000 ________ $3,000 to $4,999 ________ $5,000 to $7,499 ________
   $7,500 to $9,999 ________ $10,000 to $12,499 ________ $12,500 to $14,999 ________
   $15,000 to $19,999 ________ $20,000 to $29,999 ________ Over $30,000 ________

Thank you for helping us survey by answering this questionnaire.

Gloria D. Shibley
Extension Home Economist
Map of Salem, Scio, Stayton and Albany Areas of Oregon.
### APPENDIX C

**DESCRIPTION OF ITEMS TO BE PRICED AND THEIR CONSUMER PRICE INDEX WEIGHTS**

<table>
<thead>
<tr>
<th>Item</th>
<th>Quantity</th>
<th>Description</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Bread and Cereal Products</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Flour</td>
<td>5 pounds</td>
<td>all purpose, white Pillsbury or Gold Medal</td>
<td>0.792</td>
</tr>
<tr>
<td>Cracker meal</td>
<td>9 1/2 oz.</td>
<td>exclude sugar coated kellogg's</td>
<td>1.402**</td>
</tr>
<tr>
<td>Corn flakes</td>
<td>12 oz.</td>
<td></td>
<td>1.092</td>
</tr>
<tr>
<td>Rice</td>
<td>1 pound</td>
<td>Minute Rice</td>
<td>0.300</td>
</tr>
<tr>
<td>Rice</td>
<td>1 pound</td>
<td>long grain, store brand</td>
<td>0.744</td>
</tr>
<tr>
<td>Bread</td>
<td>16 oz.</td>
<td>white, sliced and wrapped store brand</td>
<td>4.314</td>
</tr>
<tr>
<td>Bread</td>
<td>16 oz.</td>
<td>whole wheat, sliced and wrapped, store brand</td>
<td>2.157</td>
</tr>
<tr>
<td>Cookies</td>
<td>15 oz.</td>
<td>sandwich style, chocolate w/cream filling, Cresc brand</td>
<td>2.515</td>
</tr>
<tr>
<td><strong>Meat, Poultry, and Fish</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Meat</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Beef</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Round steak</td>
<td>1 pound</td>
<td>boneless top</td>
<td>2.044**</td>
</tr>
<tr>
<td>Sirloin steak</td>
<td>1 pound</td>
<td>bone in</td>
<td>1.080**</td>
</tr>
<tr>
<td>Porterhouse steak</td>
<td>1 pound</td>
<td>bone in</td>
<td>1.180**</td>
</tr>
<tr>
<td>Rump roast</td>
<td>1 pound</td>
<td>boneless</td>
<td>1.422**</td>
</tr>
<tr>
<td>Rib roast</td>
<td>1 pound</td>
<td>blade pot roast, semi-boneless or bone in</td>
<td>0.997**</td>
</tr>
<tr>
<td>Chuck roast</td>
<td>1 pound</td>
<td>pre-ground, 90% lean, exclude hamburger</td>
<td>2.911**</td>
</tr>
<tr>
<td>Ground beef</td>
<td>1 pound</td>
<td>exclude calf liver</td>
<td>0.535**</td>
</tr>
<tr>
<td>Beef liver</td>
<td>1 pound</td>
<td></td>
<td>0.000*</td>
</tr>
<tr>
<td>Veal cutlets</td>
<td>1 pound</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pork</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pork chops</td>
<td>1 pound</td>
<td>center cut loin, exclude blade and sirloin</td>
<td>2.296**</td>
</tr>
<tr>
<td>Pork roast</td>
<td>1 pound</td>
<td>loin half, exclude center cut</td>
<td>1.105**</td>
</tr>
<tr>
<td>Pork sausage</td>
<td>1 pound</td>
<td>fresh</td>
<td>1.343**</td>
</tr>
<tr>
<td>Ham</td>
<td>1 pound</td>
<td>whole</td>
<td>0.000*</td>
</tr>
<tr>
<td>Picnic</td>
<td>1 pound</td>
<td>smoked, bone in, exclude Boston Butts</td>
<td>1.028**</td>
</tr>
<tr>
<td>Bacon</td>
<td>1 pound</td>
<td>sliced, store brand</td>
<td>2.135</td>
</tr>
<tr>
<td>Item</td>
<td>Quantity</td>
<td>Description</td>
<td>Weight</td>
</tr>
<tr>
<td>--------------</td>
<td>----------</td>
<td>--------------------------------------------------</td>
<td>---------</td>
</tr>
<tr>
<td>Other meats</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Frankfurters</td>
<td>1 pound</td>
<td>packaged, exclude all beef Ball Park brand</td>
<td>0.963 **</td>
</tr>
<tr>
<td>Lamb chops</td>
<td>1 pound</td>
<td>loin</td>
<td>0.000 *</td>
</tr>
<tr>
<td>Ham, canned</td>
<td>1 pound</td>
<td>Armour brand</td>
<td>1.284 **</td>
</tr>
<tr>
<td>Bologna</td>
<td>8 oz.</td>
<td>sliced, prepackaged</td>
<td></td>
</tr>
<tr>
<td>Salami sausage</td>
<td>8 oz.</td>
<td>Oscar Meyer or store brand sliced, prepackaged</td>
<td>1.070</td>
</tr>
<tr>
<td>Liver sausage</td>
<td>8 oz.</td>
<td>Oscar Meyer</td>
<td>1.017 **</td>
</tr>
<tr>
<td>Poultry</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Frying chicken</td>
<td>1 pound</td>
<td>ready to cook, cut up</td>
<td>2.062 **</td>
</tr>
<tr>
<td>Chicken breasts</td>
<td>1 pound</td>
<td>exclude boneless</td>
<td>0.476 **</td>
</tr>
<tr>
<td>Turkey</td>
<td>1 pound</td>
<td>fresh or frozen, Grade A 8 - 16 pounds</td>
<td>0.434 **</td>
</tr>
<tr>
<td>Fish</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Shrimp</td>
<td>10 oz.</td>
<td>frozen, breaded</td>
<td>0.830 **</td>
</tr>
<tr>
<td>Ocean perch</td>
<td>1 pound</td>
<td>frozen, breaded</td>
<td>0.846</td>
</tr>
<tr>
<td>Sole</td>
<td>1 pound</td>
<td>filet, unbreaded, fresh</td>
<td>0.114 **</td>
</tr>
<tr>
<td>Tuna fish</td>
<td>6 ½ oz.</td>
<td>canned, Star Kist</td>
<td>0.749</td>
</tr>
<tr>
<td>Sardines</td>
<td>4 oz.</td>
<td>canned, packed in vegetable oil, Underwood brand</td>
<td>0.979</td>
</tr>
<tr>
<td>Dairy Products</td>
<td></td>
<td></td>
<td>(14.702)</td>
</tr>
<tr>
<td>Milk</td>
<td>½ gallon</td>
<td>vitamin D, 3.5% butterfat, store brand</td>
<td>7.295</td>
</tr>
<tr>
<td>Milk</td>
<td>1 quart</td>
<td>skimmed, less than 0.2% butterfat, store brand</td>
<td>1.397</td>
</tr>
<tr>
<td>Milk</td>
<td>13 oz.</td>
<td>evaporated, canned, unsweetened, Carnation brand</td>
<td>1.766</td>
</tr>
<tr>
<td>Ice cream</td>
<td>½ gallon</td>
<td>vanilla, store brand, mid-quality</td>
<td>1.183</td>
</tr>
<tr>
<td>Cheese</td>
<td>8 oz.</td>
<td>processed, American, Kraft, Velveeta brand</td>
<td>1.761</td>
</tr>
<tr>
<td>Butter</td>
<td>1 pound</td>
<td>salted, exclude whipped Darigold or store brand</td>
<td>1.301</td>
</tr>
<tr>
<td>Fruits and Vegetables</td>
<td></td>
<td>(16.607)</td>
<td></td>
</tr>
<tr>
<td>Apples</td>
<td>1 pound</td>
<td>red delicious</td>
<td>1.541</td>
</tr>
<tr>
<td>Bananas</td>
<td>1 pound</td>
<td>first quality</td>
<td>0.942</td>
</tr>
<tr>
<td>Oranges</td>
<td>1 dozen</td>
<td>not Temples, best quality</td>
<td>1.327</td>
</tr>
<tr>
<td>Grapes</td>
<td>1 pound</td>
<td>seedless</td>
<td>0.000 *</td>
</tr>
<tr>
<td>Item</td>
<td>Quantity</td>
<td>Description</td>
<td>Weight</td>
</tr>
<tr>
<td>-------------------------</td>
<td>----------</td>
<td>----------------------------------</td>
<td>---------</td>
</tr>
<tr>
<td>Grapefruit</td>
<td>each</td>
<td>pink or white, seed or seedless</td>
<td>0.257 **</td>
</tr>
<tr>
<td>Pineapple</td>
<td>1 pound</td>
<td>fresh</td>
<td>0.005 **</td>
</tr>
<tr>
<td>Strawberries</td>
<td>1 pint</td>
<td>fresh</td>
<td>0.000 *</td>
</tr>
<tr>
<td>Potatoes</td>
<td>1 pound</td>
<td>Idaho baking, 10 pound bag</td>
<td>1.408</td>
</tr>
<tr>
<td>Onions</td>
<td>1 pound</td>
<td>common yellow cooking</td>
<td>0.326</td>
</tr>
<tr>
<td>Asparagus</td>
<td>1 pound</td>
<td>fresh, well trimmed</td>
<td>0.380 **</td>
</tr>
<tr>
<td>Cucumbers</td>
<td>1 pound</td>
<td>fresh, medium or dark green</td>
<td>0.373</td>
</tr>
<tr>
<td>Celery</td>
<td>1 pound</td>
<td>green</td>
<td>0.330</td>
</tr>
<tr>
<td>Cabbage</td>
<td>1 pound</td>
<td>prepackaged</td>
<td>0.434</td>
</tr>
<tr>
<td>Carrots</td>
<td>1 pound</td>
<td>medium size head</td>
<td>0.921</td>
</tr>
<tr>
<td>Lettuce</td>
<td>each</td>
<td>green, bell</td>
<td>0.126 **</td>
</tr>
<tr>
<td>Peppers</td>
<td>1 pound</td>
<td>best quality, exclude greenhouse</td>
<td>0.706</td>
</tr>
<tr>
<td>Tomatoes</td>
<td>1 pound</td>
<td>Del Monte brand</td>
<td>0.669</td>
</tr>
<tr>
<td>Fruit cocktail</td>
<td># 303 can</td>
<td>Bartlett, halves, hood</td>
<td>0.562</td>
</tr>
<tr>
<td>Pears</td>
<td># 2/4 can</td>
<td>River brand</td>
<td></td>
</tr>
<tr>
<td>Pineapple-grapefruit</td>
<td>46 oz.</td>
<td>Del Monte or Dole brand</td>
<td>0.653 **</td>
</tr>
<tr>
<td>juice drink</td>
<td># 303 can</td>
<td>sliced, Diamond A or store brand</td>
<td>0.781 **</td>
</tr>
<tr>
<td>Beets</td>
<td># 303 can</td>
<td>green, sweet, Del Monte brand</td>
<td>0.626</td>
</tr>
<tr>
<td>Peas</td>
<td># 303 can</td>
<td>whole, Del Monte brand</td>
<td>0.835</td>
</tr>
<tr>
<td>Tomatoes</td>
<td># 303 can</td>
<td>store brand</td>
<td>1.066</td>
</tr>
<tr>
<td>Dried navy beans</td>
<td>1 pound</td>
<td>not cuts, frozen, store brand</td>
<td>0.690 **</td>
</tr>
<tr>
<td>Broccoli spears</td>
<td>10 oz.</td>
<td>Minute Maid brand</td>
<td>0.436 **</td>
</tr>
<tr>
<td>Orange juice</td>
<td>6 oz.</td>
<td>frozen, 1 to 3 ratio, Minute Maid or store brand</td>
<td>0.562</td>
</tr>
<tr>
<td>Lemonade</td>
<td>6 oz.</td>
<td>frozen, 1 to 4 ratio, Minute Maid or store brand</td>
<td></td>
</tr>
<tr>
<td>Other Foods at Home</td>
<td></td>
<td>(24.710)</td>
<td></td>
</tr>
<tr>
<td>Eggs</td>
<td>1 dozen</td>
<td>Grade AA, large</td>
<td>2.259</td>
</tr>
<tr>
<td>Margarine</td>
<td>1 pound</td>
<td>corn oil, now whipped, Fleischman brand</td>
<td>0.926</td>
</tr>
<tr>
<td>Salad dressing</td>
<td>8 oz.</td>
<td>Italian, Kraft or Wishbone brand</td>
<td>0.899 **</td>
</tr>
<tr>
<td>Cooking or Salad oil</td>
<td>24 oz.</td>
<td>Wesson brand</td>
<td>1.381</td>
</tr>
<tr>
<td>Item</td>
<td>Quantity</td>
<td>Description</td>
<td>Weight</td>
</tr>
<tr>
<td>-----------------------------</td>
<td>----------</td>
<td>--------------------------------------</td>
<td>--------</td>
</tr>
<tr>
<td>Sugar</td>
<td>5 pound</td>
<td>white granulated, store brand</td>
<td>0.674</td>
</tr>
<tr>
<td>Grape jelly</td>
<td>10 oz.</td>
<td>Welch's brand</td>
<td>0.974</td>
</tr>
<tr>
<td>Chocolate bar</td>
<td>1 oz.</td>
<td>milk chocolate, Hershey brand</td>
<td>1.333</td>
</tr>
<tr>
<td>Chocolate flavored syrup</td>
<td>16 oz.</td>
<td>Hershey brand</td>
<td>1.039</td>
</tr>
<tr>
<td>Coffee</td>
<td>1 pound</td>
<td>regular grind, NJB brand</td>
<td>5.445</td>
</tr>
<tr>
<td>Coffee</td>
<td>6 oz.</td>
<td>instant, Taster's Choice brand</td>
<td>1.531</td>
</tr>
<tr>
<td>Tea bags</td>
<td>48 bags</td>
<td>Lipton brand</td>
<td>0.803</td>
</tr>
<tr>
<td>Cola drink</td>
<td>72 oz.</td>
<td>not diet, Pepsi or Coke brand</td>
<td>0.931</td>
</tr>
<tr>
<td>Carbonated fruit drink</td>
<td>72 oz.</td>
<td>store brand</td>
<td>0.910</td>
</tr>
<tr>
<td>Bean soup w/bacon</td>
<td>11 1/2 oz.</td>
<td>condensed, Campbell's brand</td>
<td>0.803</td>
</tr>
<tr>
<td>Chicken soup w/noodles</td>
<td>10 1/2 oz.</td>
<td>exclude meat sauce, Franco-American brand</td>
<td>0.578</td>
</tr>
<tr>
<td>Spaghetti w/cheese</td>
<td>15 1/2 oz.</td>
<td>instant, mashed, Betty Crocker brand</td>
<td>0.755</td>
</tr>
<tr>
<td>Potatoes</td>
<td>7 oz.</td>
<td>frozen, French fried, store brand</td>
<td>0.640</td>
</tr>
<tr>
<td>Potatoes</td>
<td>9 oz.</td>
<td></td>
<td>0.690</td>
</tr>
<tr>
<td>Baby food</td>
<td>4 1/2 oz.</td>
<td>strained, fruit or veg., Gerber or Beech-Nut brand</td>
<td>0.696</td>
</tr>
<tr>
<td>Sweet pickle relish</td>
<td>12 oz.</td>
<td>Kerry or store brand</td>
<td>0.797</td>
</tr>
<tr>
<td>Pretzels</td>
<td>10 oz.</td>
<td>hard, salted, sticks or twisted, store brand</td>
<td>0.642</td>
</tr>
</tbody>
</table>

* 6 items deleted from 93 item market basket, resulting in an 87 item market basket.

** 31 items deleted from 87 item market basket, resulting in a 56 item market basket.
## APPENDIX D

### PROFILE OF GROCERY SHOPPERS BY WHETHER RESPONDENT VALUES LOW PRICES AS A CHARACTERISTIC OF GROCERY STORES*

<table>
<thead>
<tr>
<th>% value low price</th>
<th>Male</th>
<th>Female</th>
<th>Less than 21</th>
<th>21-25</th>
<th>26-30</th>
<th>31-40</th>
<th>41-50</th>
<th>51-60</th>
<th>Over 60</th>
</tr>
</thead>
<tbody>
<tr>
<td>% do not value low price</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>51</td>
<td>2</td>
<td>8</td>
<td>1</td>
<td>21.5</td>
<td>9</td>
<td>5.5</td>
<td>5.5</td>
</tr>
<tr>
<td></td>
<td>9</td>
<td>36</td>
<td>0</td>
<td>4.5</td>
<td>4.5</td>
<td>16</td>
<td>8</td>
<td>5.5</td>
<td>8</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Income</th>
</tr>
</thead>
<tbody>
<tr>
<td>Under $3,000</td>
</tr>
<tr>
<td>% value low price</td>
</tr>
<tr>
<td>% do not value low price</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Number in Household</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
</tr>
<tr>
<td>% value low price</td>
</tr>
<tr>
<td>% do not value low price</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Marital Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Married</td>
</tr>
<tr>
<td>% value low price</td>
</tr>
<tr>
<td>% do not value low price</td>
</tr>
</tbody>
</table>
APPENDIX D (Continued)

<table>
<thead>
<tr>
<th>Education of Grocery Shopper</th>
<th>Grade School</th>
<th>Junior High</th>
<th>Senior High</th>
<th>2 years College</th>
<th>4 years College</th>
<th>Graduate School</th>
</tr>
</thead>
<tbody>
<tr>
<td>% value low prices</td>
<td>1</td>
<td>0</td>
<td>33</td>
<td>14</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>% do not value low prices</td>
<td>1</td>
<td>3.5</td>
<td>22</td>
<td>11.5</td>
<td>2</td>
<td>6</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Employment Status of Grocery Shoppers (in Hours)</th>
<th>Not Employed</th>
<th>Over</th>
</tr>
</thead>
<tbody>
<tr>
<td>% value low prices</td>
<td>30.5</td>
<td>9</td>
</tr>
<tr>
<td>% do not value low prices</td>
<td>19</td>
<td>1</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Extension Membership (ever)</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>% value low prices</td>
<td>9.5</td>
<td>50.0</td>
</tr>
<tr>
<td>% do not value low prices</td>
<td>3.5</td>
<td>36.5</td>
</tr>
</tbody>
</table>

*Percentages rounded for convenience*
APPENDIX E

Chi-Square Values for Characteristics of Grocery Shoppers by Value Placed on Low Prices.

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>df</th>
<th>$X^2$ value</th>
<th>$X^2$ value</th>
<th>$X^2$ value</th>
<th>$X^2$ value</th>
<th>Tabular value of $X^2$, $p = .05^*$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of Questionnaires Used to Test for Significance</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>27 who selected least cost basket</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>27 who did not select least cost basket</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>100</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>66</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sex</td>
<td>1</td>
<td>2.6533</td>
<td>2.0080</td>
<td>.2067</td>
<td>1.0374</td>
<td>3.841</td>
</tr>
<tr>
<td>Age</td>
<td>3</td>
<td>.8230</td>
<td>1.7538</td>
<td>.4618</td>
<td>3.5186</td>
<td>7.815</td>
</tr>
<tr>
<td>Income</td>
<td>3</td>
<td>1.6209</td>
<td>.0155</td>
<td>1.1242</td>
<td>5.3226</td>
<td>7.815</td>
</tr>
<tr>
<td>Marital Status</td>
<td>1</td>
<td>.8612</td>
<td>2.2055</td>
<td>.2067</td>
<td>2.3902</td>
<td>3.841</td>
</tr>
<tr>
<td>Number in household</td>
<td>2</td>
<td>1.7080</td>
<td>.6100</td>
<td>1.1070</td>
<td>.9732</td>
<td>5.991</td>
</tr>
<tr>
<td>Education of grocery shopper</td>
<td>2</td>
<td>.8822</td>
<td>.7143</td>
<td>1.6718</td>
<td>1.0232</td>
<td>5.991</td>
</tr>
<tr>
<td>Employment of grocery shopper</td>
<td>2</td>
<td>3.0846</td>
<td>2.9973</td>
<td>1.1013</td>
<td>.9489</td>
<td>5.991</td>
</tr>
<tr>
<td>Extension membership</td>
<td>1</td>
<td>.3524</td>
<td>.1058</td>
<td>1.2536</td>
<td>.4180</td>
<td>3.841</td>
</tr>
</tbody>
</table>

* Downie 1974
APPENDIX F

Bivariate Frequency Distribution of the Number of Major Grocery Shopping Trips and the Distance Between Home and Store.

<table>
<thead>
<tr>
<th>Number of Trips</th>
<th>Mean Distance to the Store, in Miles, for 50 Non-Employed Respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1, 8, 14, 15, 16, 17, 19, 22, 25</td>
</tr>
<tr>
<td>2</td>
<td>9, 10, 11, 12, 12, 12, 15, 16, 17, 18, 20, 24</td>
</tr>
<tr>
<td>3</td>
<td>4, 5, 5, 7, 10, 12, 14, 16</td>
</tr>
<tr>
<td>4</td>
<td>5, 7, 8, 9, 13, 13, 16, 21, 21</td>
</tr>
<tr>
<td>5</td>
<td>3, 5, 5, 8, 9, 10, 11, 13</td>
</tr>
<tr>
<td>6</td>
<td>3</td>
</tr>
<tr>
<td>7</td>
<td>4</td>
</tr>
<tr>
<td>10</td>
<td>6</td>
</tr>
</tbody>
</table>