AN ABSTRACT OF THE THESIS OF

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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,   e) number in household,
b) age,   f) education of grocery shopper,
c) income,   g) employment status of grocery
d) marital status,   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

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PRACTICES AND PREFERENCES OF RURAL GROCERY SHOPPERS IN SCIO, OREGON, 1978

I. INTRODUCTION

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 cate-
gory 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 de-
fined 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. Accord-
ing 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 pur-
chases 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 pro-
portion 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 employ-
ment 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) differentiatable 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.

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* 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 check-out 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 1

Estimate of Mean Grocery Shopping Time in Minutes by Number of Stores Shopped

1	store shopped	27 minutes*
2	stores shopped	46 minutes, total
3	stores shopped	69 minutes, total
4	stores shopped	82 minutes, total

* 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 bene-fits, 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 in-come 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 home-makers 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 pat-
terns 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 trans-
portation 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 super-
markets. 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 aver-
age 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, alterna-
tively, 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 suit-
able 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; how-
ever, 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 hypo-
theses. 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):

$$X^2 = \sum_i \frac{(f_o{}^i - f_e{}^i)^2}{fe^i}$$

Where $f_o{}^i$ = observed frequency per cell

$f_e{}^i$ = expected frequency calculated as

$$f_e{}^i = \left(\frac{c_i r_i}{N}\right)$$

Where 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):

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

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

Y_i = i^{th} observation of variable Y

N = number of observations

$\bar{X}$ = mean variable of X

$\bar{Y}$ = 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 examined 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.

Age	Percent of respondents*
Under 31	20
31 to 40	37.5
41 to 50	17
Over 50	24.5
Total	99.0

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

TABLE 3

Income Characteristics of 100 Grocery Shoppers, Scio, Oregon

Income	Percent of respondents*
Under $7,500	19
$7,500 to 12,499	20
$12,500 to 19,999	27
Over $20,000	33
Total	99

*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.

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

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.

Area	Mean* Weighted Market Baskets	Mean* Unweighted Market Baskets
Albany	$7.01	$3.99
Salem	4.82	3.03
Stayton	2.48	1.79
Scio	5.36	2.75

*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.

Area	Store	Weighted Market Basket	Unweighted Market Basket
Albany	A	2	3
	B	1	1
	C	5	4
	D	4	5
	E	3	2
Salem	F	2	2
	G	3	3
	H	1	1
Stayton	I	1	1
	J	3	3
	K	2	2
Scio	L	1	1
	M	2	2
	N	3	3

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 un-
weighted 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.

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

Area	Store	By Weighted Market Basket	By Unweighted Market Basket
Albany	A	1	1
	C	3	3
	D	4	4
	E	2	2
Salem	F	2	2
	G	3	3
	H	1	1
Stayton	I	1	2
	J	3	3
	K	2	1
Scio	M	1	1

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.

Market Basket	Number of Stores	Number of Items	Difference Between Highest and Lowest Priced Market Basket
Weighted	14	56	$14.85
Unweighted	14	56	8.67
Weighted	11	87	10.44
Unweighted	11	87	7.18

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*

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

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.

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

* 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.

	Respondents Valuing Low Prices	Respondents not Valuing Low Prices	
Respondents choosing lowest price stores	19	8	27
Respondents not choosing lowest price stores	10	17	27
	29	25	54

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 per-
ceivers 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 import-
ance in choosing a grocery store is independent of:

a) sex,

b) age,

c) income,

d) marital status,

e) number in household,

f) education of the grocery shopper,

g) employment status of grocery shopper, and

h) 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 shop-
pers.

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

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

| | | Mean Annual Savings of Shopping Three Stores over: | |
Level of Living	Annual Cost of Food at Home for 4-Person Family, Autumn 1977*	Lowest Price Single Store at Mean 4.10% Savings	Highest Price Single Store at Mean 10.27% Savings
Lower	$2,630	$107.83	$270.10
Intermediate	3,190	130.79	327.61
Higher	3,841	157.48	394.47

* 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 $\Sigma(ab + cd) < e$, 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 addition-
al 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.

V. SUMMARY, RECOMMENDATIONS AND CONCLUSIONS

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,   e) number in household,
   b) age,   f) education of grocery shopper,
   c) income,   g) employment status of grocery
   d) marital status,   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. A 93

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 = 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).

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 respon-
dents who were valuing low prices and who were also select-
ing lowest price stores. No significant demographic vari-
ables 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 house-
hold 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 dis-
tance was 12.8 miles. A possible explanation for this dif-
ference 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, shop-
pers 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.

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APPENDICES

APPENDIX A

EXTENSION SERVICE

Linn County

Oregon
State
University

Linn County Armory
P. O. Box 765, 4th & Lyons
Albany, Oregon 97321   (503) 967-3871

April 10, 1978

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

EXTENSION
☐ SERVICE

Agriculture, Home Economics, 4-H Youth, Forestry, Community Development, and Marine Advisory Programs
Oregon State University, United States Department of Agriculture, and Linn County cooperating

EXTENSION SERVICE

Linn County

Oregon
State
University

Linn County Armory
P. O. Box 765, 4th & Lyons
Albany, Oregon 97321   (503) 967-3871

April 20, 1978

Dear Scio Grocery Shopper:

We <u>really</u> 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. <u>If you have not already sent in a
questionnaire</u>, 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
questiomaire 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.

EXTENSION SERVICE

Linn and Benton
Counties

Oregon
State
University

Courthouse Annex
P.O Box 765
Albany, Oregon 97321

(503) 928-9323
(503) 926-5895

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.

STORES	TOWN	BREAD, CEREAL	MEAT, POULTRY, FISH	DAIRY PRODUCTS	FRUITS, VEGETABLES	OTHER FOOD ITEMS: sugar, oil, flour, etc.

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.)

STORES	TOWN	# TIMES SHOPPED THERE LAST WEEK	AMOUNT OF MONEY SPENT THERE LAST WEEK	# MILES FROM HOME	# MILES DRIVEN OUT OF YOUR WAY TO GET THERE (FROM WORK)

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 ___.

EXTENSION
SERVICE

Agriculture Home Economics 4-H Youth Forestry Community Development and Marine Advisory Programs
Oregon State University United States Department of Agriculture Linn and Benton Counties cooperating.

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

11. List the days of the week you grocery shop _____ ;

    Time _____ .

12. What is your age? (Check one)

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

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
    Junior high   ___   vocational school ___
    High school   ___   4 year college   ___
                               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 (ie. 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   ___ $10,000 to $12,499 ___
    $3,000 to $4,999   ___ $12,500 to $14,999 ___
    $5,000 to $7,499   ___ $15,000 to $19,999 ___
    $7,500 to $9,999   ___ $20,000 to $29,999 ___
                                    Over $30,000   ___

Thank you for helping our survey by answering this questionnaire.

Gloria O. Shibley
Extension Home Economist
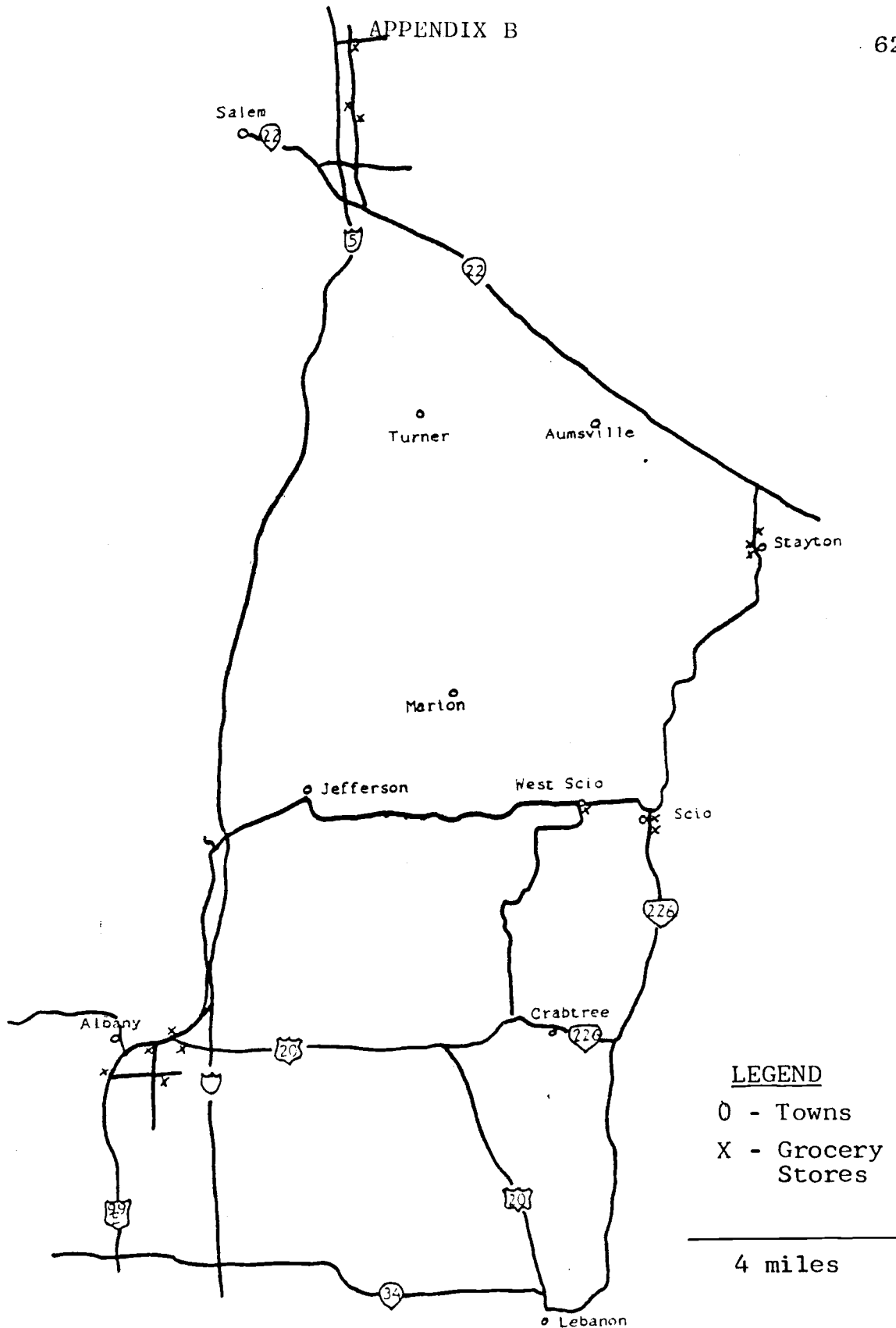
Map of Salem, Scio, Stayton and Albany Areas of Oregon.

APPENDIX C

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

Item	Quantity	Description	Weight
Bread and Cereal Products			(13.401)
Flour	5 pounds	all purpose, white Pillsbury or Gold Medal	0.792
Cracker meal	9 ½ oz.		1.488 **
Corn flakes	12 oz.	exclude sugar coated Kellogg's	1.092
Rice	1 pound	Minute Rice	0.300
Rice	1 pound	long grain, store brand	0.744
Bread	16 oz.	white, sliced and wrapped store brand	4.314
Bread	16 oz.	whole wheat, sliced and wrapped, store brand	2.157
Cookies	15 oz.	sandwich style, chocolate w/cream filling, Oreo brand	2.515
Meat Poultry, and Fish			(30.570)
Meat			
Beef			
Round steak	1 pound	boneless top	2.044 **
Sirloin steak	1 pound		1.080 **
Porterhouse steak	1 pound	bone in	1.199 **
Rump roast	1 pound	boneless	1.402 **
Rib roast	1 pound		0.969 **
Chuck roast	1 pound	blade pot roast, semi-boneless or bone in	0.755 **
Ground beef	1 pound	pre-ground, 80% lean, exclude hamburger	2.911 **
Beef liver	1 pound	exclude calf liver	0.535 **
Veal cutlets	1 pound		0.000 *
Pork			
Pork chops	1 pound	center cut loin, exclude blade and sirloin	2.296 **
Pork roast	1 pound	loin half, exclude center cut	1.108 **
Pork sausage	1 pound	fresh	1.343 **
Ham	1 pound	whole	0.000 *
Picnic	1 pound	smoked, bone in, exclude Boston Butts	1.028 **
Bacon	1 pound	sliced, store brand	2.135

Item	Quantity	Description	Weight	
Other meats				
Frankfurters	1 pound	packaged, exclude all beef Ball Park brand	0.963	**
Lamb chops	1 pound	loin	0.000	*
Ham, canned	1 pound	Armour brand	1.284	**
Bologna	8 oz.	sliced, prepackaged Oscar Meyer or store brand	1.070	
Salami sausage	8 oz.	sliced, prepackaged Oscar Meyer or store brand	1.017	
Liver sausage	8 oz.	Oscar Meyer	1.017	**
Poultry				
Frying chicken	1 pound	ready to cook, cut up	2.082	**
Chicken breasts	1 pound	exclude boneless	0.476	**
Turkey	1 pound	fresh or frozen, Grade A 8 - 16 pounds	0.434	**
Fish				
Shrimp	10 oz.	frozen, breaded	0.830	**
Ocean perch	1 pound	frozen, breaded	0.846	
Sole	1 pound	filet, unbreaded, fresh	0.115	**
Tuna fish	6 ½ oz.	canned, Star Kist	0.749	
Sardines	4 oz.	canned, packed in vegetable oil, Underwood brand	0.979	
Dairy Products			(14.702)	
Milk	½ gallon	vitamin D, 3.5% butterfat, store brand	7.295	
Milk	1 quart	skimmed, less than 0.2% butterfat, store brand	1.397	
Milk	13 oz.	evaporated, canned, unsweetened, Carnation brand	1.766	
Ice cream	½ gallon	vanilla, store brand, mid-quality	1.183	
Cheese	8 oz.	processed, American, Kraft, Velveeta brand	1.761	
Butter	1 pound	salted, exclude whipped Darigold or store brand	1.301	
Fruits and Vegetables			(16.607)	
Apples	1 pound	red delicious	1.541	
Bananas	1 pound	first quality	0.942	
Oranges	1 dozen	not Temples, best quality	1.327	
Orange juice	1 quart	fresh or reconstituted, Minute Maid brand	0.214	
Grapes	1 pound	seedless	0.000	*

Item	Quantity	Description	Weight
Grapefruit	each	pink or white, seed or seedless	0.257 **
Pineapple	1 pound	fresh	0.005 **
Strawberries	1 pint	fresh	0.000 *
Potatoes	1 pound	Idaho baking, 10 pound bag	1.408
Onions	1 pound	common yellow cooking	0.326
Asparagus	1 pound	fresh, well trimmed	0.380 **
Cucumbers	1 pound	fresh, medium or dark green	0.273
Celery	1 pound		0.380
Cabbage	1 pound	green	0.434
Carrots	1 pound	prepackaged	0.326 **
Lettuce	each	medium size head	0.921
Peppers	1 pound	green, bell	0.326 **
Spinach	10 oz.	bunch	0.000 *
Tomatoes	1 pound	best quality, exclude greenhouse	0.706
Processed fruits and vegetables			
Fruit cocktail	# 303 can	Del Monte brand	0.669
Pears	# 2½ can	Bartlett, halves, Hood River brand	0.562
Pineapple-grapefruit juice drink	46 oz.	Del Monte or Dole brand	0.653 **
Beets	# 303 can	sliced, Diamond A or store brand	0.781 **
Peas	# 303 can	green, sweet, Del Monte brand	0.626
Tomatoes	# 303 can	whole, Del Monte brand	0.835
Dried Navy beans	1 pound	store brand	1.086
Broccoli spears	10 oz.	not cuts, frozen, store brand	0.690 **
Orange juice	6 oz.	frozen, 1 to 3 ratio, Minute Maid brand	0.434 **
Lemonade	6 oz.	frozen, 1 to 4 ratio, Minute Maid or store brand	0.562
Other Foods at Home			(24.710)
Eggs	1 dozen	Grade AA, large	2.259
Margarine	1 pound	corn oil, now whipped, Fleischman brand	0.926
Salad dressing	8 oz.	Italian, Kraft or Wishbone brand	0.899 **
Cooking or Salad oil	24 oz.	Wesson brand	1.381

Item	Quantity	Description	Weight
Sugar	5 pound	white granulated, store brand	0.674
Grape jelly	10 oz.	Welch's brand	0.974
Chocolate bar	1 oz.	milk chocolate, Hershey brand	1.333
Chocolate flavored syrup	16 oz.	Hershey brand	1.038
Coffee	1 pound	regular grind, MJB brand	5.448
Coffee	6 oz.	instant, Taster's Choice brand	1.531
Tea bags	48 bags	Lipton brand	0.803
Cola drink	72 oz. carton	not diet, Pepsi or Coke brand	0.931
Carbonated fruit drink	72 oz. carton	store brand	0.910
Bean soup w/bacon	11 ½ oz.	condensed, Campbell's brand	0.803
Chicken soup w/noodles	10 ½ oz.	condensed, Campbell's brand	0.578
Spaghetti w/cheese	15 ½ oz.	exclude meat sauce, Franco-American brand	0.755
Potatoes	7 oz.	instant, mashed, Betty Crocker brand	0.648
Potatoes	9 oz.	frozen, french fried, store brand	0.690
Baby food	4 ½ oz.	strained, fruit or veg., Gerber or Beech-Nut brand	0.696
Sweet pickle relish	12 oz.	Nalley or store brand	0.797
Pretzels	10 oz.	hard, salted, sticks or twisted, store brand	0.642

*   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*

	Male	Female	Less than 21	21-25	26-30	31-40	41-50	51-60	Over 60
% value low price	3	51	2	8	1	21.5	9	5.5	5.5
% do not value low price	9	36	0	4.5	4.5	16	8	5.5	8

	Income								
	Under $3,000	$3,000- 4,999	$5,000- 7,499	$7,500- 9,999	$10,000- 12,499	$12,500- 14,999	$15,000- 19,999	$20,000 29,999	Over $30,000
% value low price	1	5	7	3.5	8	6	8	13	2
% do not value low price	2	2	2	5	3.5	2	11	13	5

	Number in Household								
	1	2	3	4	5	6	7	8	8+
% value low price	2.5	15.5	7	9.5	9.5	3.5	3.5	1	1
% do not value low price	1	15.5	9.5	9.5	6	5	0	0	0

	Marital Status				
	Married	Widowed	Divorced	Single	Other
% value low price	50	3.5	0	0	0
% do not value low price	39.5	2	1	2	1

	Education of Grocery Shopper					
	Grade School	Junior High	Senior High	2 years College	4 years College	Graduate School
% value low prices	1	0	33	14	3	2
% do not value low prices	1	3.5	22	11.5	2	6

	Employment Status of Grocery Shoppers (in Hours)					
	Not Employed	1-10	11-20	21-30	31-40	Over 40
% value low prices	30.5	4.5	7	3	8	0
% do not value low prices	19	1	7	1	16	3

	Extension Membership (ever)	
	Yes	No
% value low prices	9.5	50.0
% do not value low prices	3.5	36.5

*Percentages rounded for convenience

APPENDIX E

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

Number of Questionnaires Used to Test for Significance

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

* Downie 1974

APPENDIX F

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

Number of Trips	Mean Distance to the Store, in Miles, for 50 Non-Employed Respondents											
1	1,	8,	14,	15,	16,	17,	19,	22,	25			
2	9,	10,	11,	12,	12,	12,	15,	16,	17,	18,	20,	24
3	½,	4,	5,	5,	7,	10,	12,	14,	16			
4	5,	7,	8,	9,	13,	13,	16,	21,	21			
5	3,	5,	5,	8,	9,	10,	11,	13				
6	3											
7	4											
10	6											