AN EVALUATION OF CONSUMER PURCHASE PATTERNS FOR SELECTED FRESH FRUITS AND VEGETABLES

Thesis for the Degree of M. A.

MICHIGAN STATE UNIVERSITY

Thomas A. Creager

1956

"The Food Distribution program at Michigan State University is under the sponsorship of the National Association of Food Chains"

AN EVALUATION OF CONSUMER PURCHASE PATTERNS FOR SELECTED FRESH FRUITS AND VEGETABLES

By

Thomas A. Creager

A THESIS

Submitted to the College of Business and Public Service
of Michigan State University and Applied Science
in partial fulfillment of the requirements
for the degree of

MASTER OF ARTS

Department of General Business

Curriculum in Food Distribution

1956

ACKNOWLEDGEMENTS

The writer wishes to acknowledge the assistance received from a great number of people who graciously cooperated in this study.

First of all, appreciation is acknowledged to the National Association of Food Chains for financial help received through the graduate fellowship.

Gratitude is expressed to Dr. David J. Luck, Director of the Bureau of Business Research, and Dr. Edward A. Brand, Director of the Curriculum in Food Distribution, for their valuable advice and guidance in the presentation of this study.

The writer is also gratiful to Dr. Gerald G. Quackenbush and Dr. James D. Shaffer of the Department of Agricultural Economics who gave willingly of their time in supplying the necessary information to complete this study.

TABLE OF CONTENTS

LIST OF TABLES

CHAPTER I

INTRODUCTION

Purpose of Study

Since February of 1951, a consumer panel has operated at Michigan State University. The research project that supports this panel was originally established so as to operate continuously for a ten year period. The panel is composed of about 250 families in the Lansing area. This group of families regularly submits a weekly diary, which contains a detailed record of their food purchases made during that week, to the Department of Agricultural Economics, Michigan State University. One of the many areas in which these data provided by the Michigan State University Consumer Panel may be of usefulness is to the retail food distributor.

With the trend to self-service fresh fruit and vegetable operations in the retail food stores, the retailer is becoming more isolated from his customers. In the past he knew his customers through servicing their needs; and by talking with them he not only discovered what they wanted and what they bought, but he obtained information that enabled him to estimate the future needs of his customers. The present lack of personal contact and absence of information as to the total retail market situation for fresh produce have in some cases resulted in the retailer being unaware of his relative competitive position and the techniques he might use to increase his sales and profits.

It is felt that information which reflects the purchases of the consumer in the market place will be of value to the food retailer in reaching merchandising decisions. A comprehensive knowledge of the fresh produce purchase patterns for different types of fruits and vegetables appears to be essential if merchandisers are to purchase, promote, display, and price effectively and profitably. Undoubtedly many merchandisers have gained sufficient knowledge through personal experience and detailed records to do an effective job. To those in this category this thesis may be looked upon as a complementary source of information. However, it is believed that there are many others who have an inadequate knowledge of purchase patterns and therefore must rely upon rule of thumb and conjecture in their merchandise practices.

Thus, the purpose of this thesis, "An Evaluation of Consumer Purchase Patterns for Selected Fresh Fruits and Vegetables" is twofold. The first purpose is the presentation of processed data collected from food purchase diaries so as to reveal to those interested in fruit and vegetable merchandising the types of information that are available and of possible usefulness to them. The second purpose is to evaluate these data in terms of serviceability for food retailers by applying these data to certain specified functions of merchandising to determine whether these data can or cannot be adapted to these functions.

Economic Significance of Study

Marketing, or the movement of products through the channels of distribution to the ultimate customer, cannot be viewed as having

economic importance to only one of the many institutional groups interested in merchandising fruit and vegetables to the exclusion of all others involved in marketing of the same products. By the very definition of merchandising as defined by the American Marketing Association as "the planning involved in marketing the right merchandise or service at the right place, at the right time, in the right quantities and, at the right price," it would by necessity cut across all groups involved in moving the particular product to its final destination.[1] Farmers, their marketing organizations and associations, wholesalers, and retailers are engaged in merchandising fresh fruits and vegetables. They are all involved in promotional activities, designing and building attractive packaging materials and displays, advertising product and service differentiation in an effort to establish customer loyalty and pricing competitively so as to attract new customers. Thus, any research which delves into a study of the customer's habits and preferences for a particular line of food products affects all involved groups.

Many people seem to regard marketing as merely a passive act in which the function of the marketing agency is merely to stand ready to supply demands. But in a dynamic economy, in which competition is the coordinator, marketing institutions are always attempting to create new and larger demands for their products. Some uncertainty may result, but this is one of the facets of economic growth.

---

[1] R. M. Walsh. "And What Are Its Parts?" Yearbook of Agriculture, United States Department of Agriculture, Washington, D. C., 1954, p. 8.

Through this study, a knowledge of existing and potential new demand as represented by consumer expenditure in dollars and cents and in physical quantities is provided.

Retailing is selling to the customer. The retail food store is at the end of the marketing channel. In it the products of the farm in a multitude of varieties and forms are gathered, it is that part of the distributive process that gives purpose to all that which has gone on before it.

The basic task of the food retailer is to provide service. He has to determine the wants of his customers and then acquire and price at competitive levels anywhere from a dozen to a hundred different kinds of fresh fruits and vegetables in all of their varieties and sizes. The average consumer expects the marketing system to keep the goods flowing continuously into the retail outlets at prices that allow her a rising standard of living. That goal requires tremendous amounts of effort and know-how by all marketing agencies.

What do the customers want? As consumers we all think we know what we want. Yet few questions in marketing are harder to answer. It is an important question, because decisions for all marketers are based on this answer. Am I packaging in the quantities desired by customers? Is the variety sufficient to attract additional sales and new customers? Are the right items being promoted so as to attract additional traffic? These are just a few of the questions that retailers need answers to. Answers to these problems are provided if the retailer can give a positive reply to the query; What do the customers want?

Marketing research has worked out various ways of learning what customers want. Techniques such as observation, interviewing, reporting panels, controlled experiments at retail stores, etc. are making available to the merchandising executive factual information for decision making in place of wasteful trial and error methods.

An efficient marketing system is one that gives the public as nearly as possible what it wants. Improvements in efficiency come gradually in an economy that is dominated by free enterprise and competition. The main job for the researcher in both private and public institutions is to make information available to all those who can use it.

Regardless of the individual problems faced by farmers and marketing agencies in the handling and selling of commodities there is one common problem that permeates the entire marketing structure. They need to understand the marketing process better, because understanding is one of the highways to improvement.

Scope of the Study

Studies of consumer behavior usually fall into two classifications: (1) identification of customers and (2) their buying behavior. The purpose of such studies is to ascertain who buys, where, what, when, and how. This thesis will have elements of who, what and how woven throughout.

Identification of customers seeks to determine who the customers are. It is not sufficient to study buying behavior patterns without knowing whose buying is involved. Hence it is necessary to identify the composition of customers. Incidentally, the terms "customers"

and "consumers" will be used interchangeably throughout this thesis, although there is a technical distinction. A customer is the purchaser of goods and services while a consumer is the user of goods and services.

Composition of customers could include the complete gamut of characteristics such as sex, income, religion, nationality, education status, occupation, family size, and so on. The buying behavior is affected by each of these characteristics; however, the relative significance of each would vary greatly depending upon the items of purchases. In this study it would be impractical and unnecessary to study all of these characteristics. However, for certain of the commodities (apples, potatoes, grapefruit, oranges) an attempt will be made to determine the relationship between family size and income to frequency of purchase, size of purchase, and total quantity purchased.

A distinction should be made between buying habits and behavior. Habit is a tendency toward a particular action that has become almost spontaneous through repetition, while buying behavior patterns represent the buying design of a large number of customers. Customer buying habits and behavior are not fixed, although it may take a period of time before they can be changed. A combination of different factors are always in operation to change food buying behavior. Several of these factors are automobiles, shopping centers, self-service supermarkets, frozen foods, prepackaged produce, prepared foods that require little if any preparation, better home refrigerating facilities, etc.

According to William Applebaum of Stop and Shop, Inc., consumer buying behavior can be grouped in relation to:[2]

1. Place of purchase.
2. Items purchased.
3. Time and frequency of purchase.
4. Method of purchase.
5. Response to sales promotion devices.

Data from the Michigan State University Consumer Panel contributes information on only the second, third, and fourth items. For purposes of this thesis only fresh fruits and vegetables will be studied from the viewpoint of what items, how much of each item by size or weight, by expenditure dollar, by frequency of purchase, and by season for the twenty-five most important fresh fruits and vegetables in terms of expenditure.

A more detailed analysis will be given to four of the twenty-five commodities. These commodities are potatoes, apples, oranges, and grapefruit. This analysis will attempt to examine the relationship between who the customers are by family size and income, and the frequency and quantity of the items they purchased. Also these four items will be considered for size of purchase so that more satisfactory sized units of purchase may be displayed in the fruit and vegetable counters. Commodity merchandising studies that are pertinent to the development of the discussion will also be presented.

---

[2] W. Applebaum. "Studying Consumer Behavior in Retail Stores." Journal of Marketing, October 1951, p. 172.

Method of Study

Customer wants and needs can be studied directly or attempts may be made to infer them from studies of behavior. Five principal methods can be used in such consumer investigations:[3]

1. Measures of product consumption.
2. Retail store records of sales, prices, and inventories.
3. Sales experiments in retail stores.
4. Direct surveys.
5. Reporting panels.

Each has special advantages particular to itself but by the same token each has its own individual drawbacks. Because of the existence of an operating reporting panel and a need for an evaluation of the usefulness of these data for food retailers the fifth technique was chosen as being the most expedient for this study.

Although the consumer reporting panel has been chosen by the author as the technique to be used in investigating consumer behavior, it should not be assumed that this method is necessarily the superior technique. The other four techniques have their own peculiar advantages and defects in solving the variety of diverse problems arising in this field.

---

[3] F. Clements and T. Meyers. "How They Tell What We Want." Yearbook of Agriculture, United States Department of Agriculture, Washington, D. C., 1954, p. 207.

CHAPTER II

SOURCE AND NATURE OF THE DATA

Objectives of the Michigan State University Consumer Panel

The Michigan State University Consumer Panel is a group of about 250 families, who reside in Lansing, Michigan. These families report their food purchases weekly through the medium of a diary. (See Appendix for copy of diary.) Diaries are filled out so that the price per unit, quantity bought and total expenditure for each food item purchased are recorded. Completed diaries are then mailed to the Department of Agricultural Economics, Michigan State University where the data are transferred onto I.B.M. cards. The data from these food purchase diaries were the primary source of information for this thesis.

The project that supports this panel was approved in 1948 and was designed to continue for ten years. The first diaries were submitted to the department in February 1951; however, it was not until mid-summer of that year that families were reporting on a regular basis. Since that time the number of panel members has remained at about 250 families.

The objectives of the original project were as follows:

> "The first is to determine the effect of price changes (both real and money) upon the quantities of food purchased, and the associated time-lag adjustment. The second objective is to determine the effect of a change in income (both real and money) upon the quantity purchased and expenditure for

various food products, and the associated time-lag. The third objective is to measure the effect of price changes and income changes upon substitution among different products. In a sense, therefore, the objectives are to determine price elasticity, income elasticity, and cross elasticity of demand."[1]

The justification for the establishment of a panel are as follows:

"Many surveys have established certain relationships among different sectors of the population at a point in time, and many studies of time series data provide aggregative relationships over time. But, problems arise in explaining changes in aggregates without a knowledge of the component parts. Also, different sectors of the component parts may not respond over time as they would be expected to based on relationships at a point in time. A second underlying reason for the project involves the time period for which most consumption data are available, namely annual data. Responses to year to year changes may not represent the responses to which producers and marketers must adjust in many of their week to week and month to month activities. Many researchers in demand analysis have expressed the need for cross-sectional analysis over time and for short-period data."[2]

In addition to providing information related to the studies of elasticities, the panel may also serve as an excellent source of information related to consumer purchase patterns, buying habits, etc. It is this supplementary type of information that the author feels will be most useful to the retail food merchant as an aid to the successful management of a fresh fruit and vegetable department.

Operation of the Panel

The leadership for the organization and operation of the Michigan State University Consumer Panel has been under the direction of

---

[1] G. G. Quackenbush. "Demand Analysis from the M.S.U. Consumer Panel." A paper delivered at a joint meeting of the American Statistics Association, and the American Farm Economics Association, Washington, D.C., December 30, 1953.

[2] Ibid., p. 14.

Dr. Gerald G. Quackenbush and Dr. James D. Shaffer. Dr. Shaffer's doctorate dissertation dealt with the methodological problems of organizing and operating a panel.[3]

The initial step in establishing a panel was to obtain a sample census of the Lansing population; the characteristics of the population were not well known, since the last census was ten years old. The census would not only give an insight into the characteristics of the Lansing population, but would provide a pool from which new members could be drawn in case prospective members refused to participate or subsequently dropped out.

It was decided that a sample of approximately 2000 families, or about seven percent of the population, would provide an adequate level of reliability, and at the same time provide a sufficient substitution pool. The 2000 family sample was selected systematically by taking every fourteenth residential address from the street and address list in the Lansing City Directory published by R. L. Polk and Company. A total of 1885 interviews were successfully completed in the spring of 1950 and were used as the basis for the panel sample.

From the original sample a sub-sample was drawn using four control factors which are as follows: (1) income of the family, (2) number of individuals in the family, (3) education of the housewife, and (4) age of the housewife. This sub-sample consists of 300 families or about one percent of the population. To provide for non-

---

[3] J. D. Shaffer, "Methodological Basis for the Operation of a Consumer Purchase Panel." Unpublished Ph. D. thesis, Department of Agricultural Economics, Michigan State University, 1952.

cooperators and "drop outs" a method of substitution was provided which involved four control factors in addition to the four mentioned above. Incidentally, the families least likely to cooperate were those in the low or high income groups, those where the housewife had an eighth grade or lower education, those with broken homes, those where the housewife was elderly, and those where both the housewife and husband worked.[4]

When panel members drop out, new members are selected from the families in the sample census so as to be as much like the replaced family as possible. When panel members move from the city, an attempt is made to replace them with families who are moving into the city. Provisions are also made for adding a small number of newly created families so that the panel representiveness is maintained over time. A second sample census was taken in 1954 as a basis for revising the sample and to provide a new pool of potential members.[5]

Monetary payments are made to panel members as an incentive to return their diaries promptly without interruption. Payments range from five cents to fifty-five cents per diary, with the largest premium being paid to those families who return their diary for the longest periods without interruption. The maximum that any member can earn is $27.60 a year.[6]

---

[4] J. D. Shaffer. "A Plan for Sampling a Changing Population Over Time." Journal of Farm Economics, Vol. 37, 1954, pp. 153-163.

[5] H. M. Riley. "Some Measurements of Consumer Demand for Meats." Unpublished Ph. D. thesis, Department of Agricultural Economics, Michigan State University, 1954.

[6] Quackenbush, op. cit.

The diary is an itemized listing of all important food products categorized into major food types. In contrast to a journal type of diary the member needs only to write in the quantities bought, price paid, and the expenditure for each food product or item purchased during the seven days. In addition, where it is appropriate, the member checks certain aspects of the item that are of interest to the department. For example, with fruits and vegetables the method of preservation is checked (fresh, frozen, canned, dried or jam, jelly, etc.); starting in 1955, fresh purchases were further classified into prepackaged and bulk. Purchases of about 500 different products can be entered in the diary.

Other information that is reported weekly is as follows: (1) all disposable income received during the week, (2) the number of and amount spent for meals away from home, (3) number of guest meals served at the home, (4) changes in household membership, and (5) gift food items received, home-grown produce or killed meat items used.

As mentioned before, all data are transposed onto I.B.M. cards. Cards can be sorted into numerous classifications depending upon the information that is desired. These tabulations provide price, quantity, and expenditure information by individual products or product groups for specific time periods according to families or family characteristics. However, the processing burden makes it impossible for data to become available for analysis until after a period of time has elapsed.

Characteristics of the Lansing Population

So that the information collected from panel members may be useful to retailers in other population areas, a knowledge of the Lansing population is essential. The census of population taken in 1950 provides the most recent complete survey of this area. A summary of the pertinent statistics of Lansing is contained in Table 1. So that comparisons can be facilitated, statistics of Michigan and the United States are also included.

Population characteristics which should be of interest in studying purchase patterns of selected fresh produce items are as follows:

1. Low percentage of non-white as compared to both Michigan and the United States.
2. Slightly lower than average number of persons per household.
3. Larger percent of females 14 years old and over in the labor force as compared to Urban Michigan, but a lower percent than the rest of the United States. (The number of employed females has been accepted by the food industry as one of the reasons for the increased demand for convenience types of foods as opposed to food that requires larger amounts of time in preparation.)
4. The lower percentage of employed in manufacturing and the lower percentage unemployed in relation to the rest of Urban Michigan. This may be partly explained by the fact that Lansing is the state capital, thus it has a large number of people who are engaged in civil service occupations.

TABLE 1

CHARACTERISTICS OF LANSING POPULATION, 1950*

Characteristics	Lansing	Michigan	Urban Michigan	United States Urban	United States Total
Total population	92,000	6,371 M.	4,503 M.	96,468 M.	105,697 M.
Percentage increase 1940-1950	17.0	21.2	18.6		14.5
Median age (years)	30.8	29.8	30.2	31.6	30.2
Percentage 65 years old or over	8.0	7.2	6.6	8.1	8.1
Percentage non-white	3.3	7.1	9.5	10.1	10.4
Persons per household	3.16	3.42	3.39	3.24	3.38
Percentage of males 14 years old and over in labor force	81.5	80.0	81.9	76.1	76.4
Percentage of females 14 years old and over in labor force	36.3	27.3	30.2	42.5	36.7
Percentage of labor force unemployed	4.8	5.4	5.8	5.6	4.3
Percentage employed in manufacturing	33.8	40.9	44.3	29.4	25.9
Median income families	$4097	$3519	$3815	$3431	$3073
Percent of families with income less than $2,000	20.7	28.4	24.4	32.6	38.6
Percent of families with income more than $6,000	21.6	15.7	18.6	15.3	12.3

*Census of Population, "Characteristics of the Population." Vol. II, Bureau of Census, Washington, D. C., 1950.

5. Lansing is a city with a comparatively high level of income. The median family income was $4,097 in 1949. This is seven percent higher than the rest of Urban Michigan, 19 percent higher than the Urban United States, and 33 percent higher than the United States as a total. This higher income level is further brought out by the fact that there is a smaller percentage of Lansing families with incomes of less than $2,000 and a larger percentage of Lansing families with incomes of over $6,000.

Reliability of the Panel

One question of importance to the researcher who uses data derived from a sample population is: Is the panel representative of the measured population? It is difficult to obtain an original sample that is representative of the population as classified in the original sample, but the problem is even more acute in maintaining sample reliability over a long time period.

Observation of Table 2 reveals that characteristics of the population have not changed greatly in some instances, while in other instances there appears to be rather wide discrepancies. As pertains to the average age of housewives, the increase in age probably represents the normal age increase of the original sample over the four year period. Additional panel members will be recruited from younger housewives so that the average age of all members will more closely reflect the original sample age of 42.7 years.

TABLE 2

CHARACTERISTICS OF THE AVERAGE FAMILY IN THE M.S.U. CONSUMER PANEL AT DIFFERENT TIME PERIODS COMPARED TO THE AVERAGE FAMILY IN THE 1950 SAMPLE CENSUS*

Family Characteristics	1950 Sample Census[a]	M.S.U. Consumer Panel			
		Jan. 1 1952	Jan. 1 1953	June 30 1953	Jan. 1 1954
Average age of housewife (years)	42.7	45.0	45.6	46.6	46.6
Average education of housewife (years)	10.9	11.1	11.2	11.3	11.3
Average family income last year (dollars)	$3758[b]	$4184[c]	$4406[d]	$4584[e]	$5079[f]
Average number of persons per family	3.28	3.39	3.29	3.18	3.22
Number of families reporting	1885	207	242	230	244

*Riley, op. cit., p. 67.

[a]Personal interview survey of 1885 Lansing families.

[b]1949 income after taxes.

[c]1951 income after taxes.

[d]1952 income after taxes.

[e]1953 income after taxes.

[f]1953 income after taxes.

Fluctuations in the average education of the housewife and average number of persons per family are minor. Deviations in the former have not been over four-tenths of a year while deviations in the latter varied within a range of not more than two-tenths of a person.

The characteristics which have shown the greatest amount of change is the level of average family income. However, in appraising the reliability of the sample census two conditions should be observed. First, families are classified on the basis of last year's income, so that on each January 1st average income of panel members is calculated based upon the previous year. Second, since 1950 the average level of income has been on the upward trend.

> "If family incomes in Lansing moved parallel to national disposable income per person, the average level of income for panel members in 1952 (based on 1951 realized income) should have been $4,359. On this basis the actual level appeared to be less than desired for an optimum sample; however, this seemed to be corrected as the panel moved into 1953. The panel average of $4,584 for June 30, 1953 was about 22 percent above the 1949 level of $3,738. This compared with an overall increase in national disposable income of 19 percent for the corresponding period.
>
> "Local income data on gross weekly earnings of manufacturing workers in Ingham County, where Lansing is located, showed an increase of 21 percent from the last half of 1951 to the first half of 1953. Weekly average income of panel members reported on a current basis rose 16 percent during the same period. The difference in rate of increase could be due to the lag in wage increases received by non-manufacturing workers and to the increase in overtime pay for manufacturing workers. Families with fixed incomes also affected the panel average."[7]

Another criterion of sample stability is the continuity of number of families reporting. Table 3 shows a frequency of distribution of families that have participated in the panel for varying

---

[7] Riley, op. cit., p. 66.

TABLE 3

NUMBER OF FAMILIES REPORTING CONTINUOUSLY FOR SELECTED TIME PERIODS, BY YEAR STARTED REPORTING, FEBRUARY 1951 TO MAY 1955, M.S.U. CONSUMER PANEL* [a]

No. of Weeks	1951 no.	1952 no.	1953 no.	1954 no.	1955 no.
1 - 4	41	18	17	16	8(5)
5 - 11	28	12	7	10	9(8)
12 - 26	23	7	5	17(10)	19(19)
27 - 51	14	8	2	23(21)	....
52 - 78	28	10	14(12)	7(6)	....
79 - 104	10	3	11(11)	....	....
105 - 130	5	10(8)	16(16)	....	....
131 - 156	7	24(20)	....	....	....
157 - 182	6(3)	27(27)	....	....	....
183 - 208	38(35)	....	....	....	....
209 and over	54(53)	....	....	....	....
Total	254	119	72	73	36

*J. D. Shaffer and G. G. Quackenbush. "Cooperation and Sampling in Four Years of M.S.U. Consumer Panel Operation." Quarterly Bulletin, Michigan Agricultural Experiment Station, August 1955, p. 94.

[a] "Continuously" is interpreted as meaning that the family missed no more than 4 percent of the diaries in the time period they were in.

() Parentheses mean that this number is still in the panel. They total 254, or 86 percent of the May 1955 panel of 297 members.

lengths of time. As it can be noted there has been fairly good stability of panel member participation since the inception of the panel in the spring of 1951.

Retailing Produce in Lansing

There are several sources of supply for fresh fruits and vegetables which are available to the Lansing family. First, and by far the most important, is the combination retail food store and the speciality fruit and vegetable market. In the retail food trade of Lansing, Michigan there are a total of 208 stores which do a total annual volume of $36,712,000.[8] As it might be expected the food retailing structure is not unusual for a city of this size. Four large corporate chains maintain units in the city. These firms are the Great Atlantic & Pacific Tea Company, National Tea Company, Kroger Company, and Wrigley Stores, Inc. (since March 1955). A local chain operates three supermarkets, and until 1953 another local chain operated six supermarkets. The second local chain has since been acquired by National Tea Company. These firms operate a total of 19 supermarkets in or near Lansing, all of which carry a complete line of fresh produce.[9] As indicated by the total number of stores, there are several individually owned supermarkets and superettes and a large number of small neighborhood groceries which carry produce.

---

[8] Anon. "Census of Business, Retail Trade." Preliminary Data. Bureau of Census, Washington, D. C., 1954.

[9] Riley, op. cit., p. 63.

Competition is quite keen among the supermarket operators for the consumer's weekly produce dollar. These stores usually run single or double page ads once a week and a less-than-a-page ad one other day of the week. The primary media is the Lansing State Journal, which is the only local daily newspaper. In addition, one chain uses a radio program, while two others use spot radio announcements. Undoubtedly this advertising does much to influence the relative quantities of the different varieties that are purchased in Lansing during any one week. The effect is probably much greater when a particular item is featured by more than one chain.

Another source of supply is the producer roadside stand. During the winter months these stands are inoperative because of climate and lack of items to sell. During the summer months these stands are of greater importance in the distribution of produce commodities throughout the state. However, in the Lansing area roadside selling of produce items is quite unimportant.[10]

Producers in this area have available to them a public market located within the corporated limits of Lansing. This municipally owned market is primarily a retail market; however, it does engage in some wholesale transactions. In addition to farmer representatives there are several other types of sellers in this market. First, there is the trucker who buys produce from farmers and resells it in the public market. Second, the dealer who sells out-of-state produce on the market, usually citrus and bananas. Information on sales and

---

[10] An estimate by the County Agricultural Agent of Ingham County indicates there are probably no more than half a dozen such stands in the county.

use of the market by consumers has been impossible to obtain because records revealing this type of information have not been kept. The last information available was in 1930 which shows that total sales were estimated at $306,815.[11] However, this figure includes not only fruits and vegetables but items such as meat, dairy products, poultry meat, eggs, baked and canned goods, cut flowers and other miscellaneous items. Also to be considered is the fact that it is unknown what proportion of these sales are made to the ultimate customers as opposed to retailers. It can generally be concluded that the public produce market is a relatively unimportant source of supply for fruits and vegetables for the ultimate consumer. Exceptions to this conclusion might be made for certain summer and fall months when quantity purchases of apples, peaches, tomatoes, and potatoes can be made there.

Minor sources of supply for the urban consumer, such as home grown gardens, fruit trees, and gifts from neighbors are excluded from these data since there is no expenditure made. From the several different sources of supply available to the Lansing consumers, it can quickly be ascertained that the major source of most produce supply is the retail food store.

Processing of the Data

As was mentioned earlier, a procedure has been established in the Department of Agricultural Economics for the coding of the data from

---

[11] O. Ulrey. "Public Produce Markets of Michigan," Agricultural Experiment Station, Michigan State College, Special Bulletin No. 268, May 1937, p. 13.

the panel diaries and the punching of them on I.B.M. cards.[12] From the punched card, tabulations can be made by sorting the cards for the information that is desired. When work began on this study, tabulations which disclosed the seasonal purchase patterns of fresh fruits and vegetables were already available for 1952 and 1953, and during the study data on 1954 expenditures became available.

Information on amount of expenditure, percentage of total expenditure for each item, and average percent of families buying each week were derived from each thirteen-four week period of 1952, 1953, and 1954. Processing of the data revealed minor fluctuation, which will be discussed in the following four chapters.

For quantity totals, only the year 1953 was used. In the interpretation of the quantity information a problem arose which involved inconsistencies of reporting units. For example, oranges are sometimes reported on a unit basis and in other cases on a weight basis, with the reporter failing to specify the basis of measurement. In most instances these points of confusion can be easily corrected because the obvious intension is apparent. When these omissions are not apparent a telephone call to the family involved often clarifies the point in question.

For some items both gift and home grown amounts are received by panel members. This is particularly true for home grown items during the summer and fall months. Although these are consumed

---

[12]This procedure for I.B.M. analysis was developed by Dr. G. G. Quackenbush and Dr. J. D. Shaffer.

they are not reflected as purchases by panel members. For this reason they are not included in total aggregates or other computations.

In the more detailed study of the four commodities, oranges, grapefruit, apples, and potatoes, tabulations pertaining to individual family purchases were studied. The families were classified in several respects. First, families were sorted into groups based upon the quantity purchased; second, they were grouped according to frequency with which they made purchases; third, families were sorted into three equal income groups; and fourth, families were sorted by number of persons in the family. These four classifications were then applied to determine if they were related to either family characteristics or frequency, size, and quantity of purchase. Because of the seasonality considerations involved in the purchase of these items only those families who reported their diaries for 50 or more weeks were used.

From the family individual purchase tabulation it was possible to record the size of each purchase made by the family during the week. From this information studies of the most frequently purchased size unit and the size unit that contribute most to total quantities can be made. To facilitate this study additional data became available in 1955. New diaries at the start of 1955 made it possible for panel members to report whether they purchased fresh fruits and vegetables in prepackaged form or in bulk form. Unfortunately only the first twelve weeks of the year are available at this writing.

Despite the incompleteness in time this information will disclose to the food merchant the wide possibilities of this type of data in helping to plan the package size that offers the greatest potential sales appeal.

Limitation of Data

In addition to the limitation of consumer reporting panels mentioned heretofore, there are several limitations which are inherent in the data itself. First, and perhaps most obvious is the limited geographical area of coverage. The city of Lansing is the statistical universe for the panel. To the extent that the Lansing population has characteristics similar to other areas in which the data might be applied, the results might be expected to be quite similar. As was pointed out in Table 1, the Lansing area was quite similar to other urban areas in Michigan and in the United States for certain characteristics but other characteristics exhibited elements of dissimilarity.

A second problem in the use of this data is the impossibility of making comparisons on the basis of quality characteristics or variety distinctions. There is little that can be done in this area since it is believed that most housewives could not distinguish varieties unless otherwise marked, and could not identify and report purchases by grade. Grades of fresh fruits and vegetables are of wholesale origin and intended to facilitate trading at channels above consumer level. Therefore, it is doubtful, even if these grades were known by consumers, that they would accurately reflect the characteristics of quality that the customer considers in making her purchase.

Moreover, material collected from the panel does not furnish data for the analysis of buying motivations or the effect on behavior of information or misinformation about the product. Although the panel is a relatively sensitive indicator of trends, it provides no knowledge of why there are non-users of a product and hence cannot point out how to capture potential markets.

Finally, there are undoubtedly some errors in reporting fresh fruits and vegetables. Because fresh fruits and vegetables constitute a fairly large portion of the weekly sales budget it is believed that error of omission are few. Exception to this might be made where the fruit or vegetable item purchased is of small quantity and is the only item purchased. Errors of confusion are probably small but are possible for some of the fruit items like berries and between oranges and tangelees. Also, there is the possibility that some errors are made in distinguishing between items that are prepackaged and those that are bulk purchased.

CHAPTER III

PURCHASE PATTERNS AND CHARACTERISTICS OF FRESH POTATO PURCHASERS

The potato is a basic produce item which accounts for one-eighth to one-sixth of each dollar that is spent in the produce departments of Lansing, Michigan. Because there are both early and late varieties of potatoes and because of the keeping qualities of this product, potatoes are available throughout the entire year.

It has long been recognized by merchants in the produce business that the potato is the "backbone" item of every fruit and vegetable department. Panel data substantiates this belief: for during most of the months of the year potatoes rank first among all fruits and vegetables in both dollar expenditure and quantity consumed. Years in which this is not true are years in which the average price is so low that increased purchases are not sufficient to compensate for the lower price. This fact is vividly portrayed in Table 4, which shows the expenditure per capita and the average percent of families buying each week during the thirteen-four week periods of 1952, 1953, and 1954. During 1952 and 1953 potatoes ranked first in expenditure with $4.66 and $3.50 per capita being spent respectively for potatoes, while in 1954 fresh potatoes dropped to second position in expenditure rank with $3.02 per capita being spent. The marketing seasons of 1951-1952 and 1952-1953 were characterized as high potato price years, while the marketing season of 1953-1954 was a high production-low price potato year.

TABLE 4

YEARLY VARIATION IN EXPENDITURE PER CAPITA AND AVERAGE PERCENT OF FAMILIES BUYING FRESH POTATOES EACH WEEK BY THE THIRTEEN-FOUR WEEK PERIODS OF THE YEAR*

Period	Expenditure Per Capita			Average Percent of Families Buying Each Week		
	1952	1953	1954	1952	1953	1954
I	$ .30	$ .34	$ .18	32%	34%	32%
II	.35	.32	.14	38	32	30
III	.34	.29	.18	35	34	34
IV	.38	.27	.15	40	36	35
V	.21	.25	.24	35	37	40
VI	.39	.32	.32	46	43	42
VII	.44	.28	.32	49	42	39
VIII	.46	.25	.30	50	38	39
IX	.32	.24	.27	35	37	37
X	.37	.23	.23	38	34	34
XI	.52	.31	.25	28	31	31
XII	.35	.20	.24	30	27	30
XIII	.23	.20	.20	24	28	28
Total	$4.66	$3.50	$3.02	37%	35%	35%

*Michigan State University Consumer Panel Data.

Being a product of inelastic demand the price is subject to large fluctuation when production varies from year to year. Thus the extreme variation in expenditure per capita during the three years can be accounted for. Table 5 further adds to the clarification of this fact. Viewing the first two-four week periods in 1953 (high potato prices) shows that substantially the same quantity was purchased at considerably higher prices than during the last two-four week periods in 1953 (lower prices).

Although not revealed from a study of panel data, there is a long time downward consumption trend that is affecting the potato industry. The year to year fluctuations in expenditure tend to hide the direction of the trend. The most obvious influence that is causing a downward spiral in potato consumption is the desire for a better diet. Mr. David G. Melnicoff of Penn Fruit Company pointed out at the National Association of Food Chains Produce Clinic of 1954 that in 1912 we ate about 176 pounds of potatoes per person while in 1952 we ate about 100 pounds of fresh and processed potatoes--a decline of about 40 percent.[1] Hand in hand with the desire for a better diet and an increased family income is the increased demand for more processed convenience type foods. Perhaps then the increased use of prepackaged potatoes in both unpeeled and other prepared forms will help reverse this trend.

Fresh Potato Purchase Data

According to Table 4, about 35 percent of the families bought potatoes each week with some variance taking place during the seasons

---

[1] D. G. Melnicoff. "Economic Trends in Produce Consumption." A speech presented at the National Association of Food Chains Produce Clinic on March 15, 1954.

TABLE 5

SEASONAL VARIATION IN FRESH POTATOES QUANTITY, EXPENDITURE, EXPENDITURE RANK, AND FREQUENCY OF PURCHASES DURING THE THIRTEEN-FOUR WEEK PERIODS OF 1953*

Time Period	Quantity Purchased Per Person	Expenditure in Cents Per Person	Expenditure Rank Among Fruits and Vegetables	Average Percent of Families Buying Each Week
	(pounds)	(cents)		(percent)
Dec. 28, 1952- Jan. 24, 1953	5.5	.34	1	34
Jan. 25 - Feb. 21	5.6	.32	1	32
Feb. 22 - Mar. 21	5.6	.29	1	34
Mar. 22 - Apr. 18	5.6	.27	2	36
Apr. 19 - May 16	5.3	.25	2	37
May 17 - June 13	5.6	.32	1	43
June 14 - July 11	5.4	.28	2	42
July 12 - Aug. 8	5.2	.25	2	38
Aug. 9 - Sept. 5	6.2	.24	2	37
Sept. 6 - Oct. 3	7.1	.23	4	34
Oct. 4 - Oct. 31	11.5	.31	2	31
Nov. 1 - Nov. 28	5.8	.20	3	27
Nov. 29 - Dec. 26	5.6	.20	3	28
	80.0	3.50	1	35

*Michigan State University Consumer Panel Data.

of the year and between the years. During the first seven months of 1952 there was an unusually large number of families buying potatoes each week. When compared with the same time period of 1953 and 1954 this becomes very apparent. The reason for this occurrence seems to be the result of government price control regulations that were in existence during 1952. Potatoes were placed under ceiling regulations on January 19, 1952. According to the United Fresh Fruit and Vegetable Association the effect of the controls was "to disrupt potato marketing, diverted great quantities of potatoes to black market channels, and caused potatoes to disappear from retail stores."[2] A short crop of potatoes which under normal conditions would have been spread out over the long marketing season, due to price acting as a brake on consumption was used too quickly; so that for a short time in the spring of 1952 potatoes became almost unobtainable. The effect of the price control was so disastrous that Congress in July 1952 passed an amendment exempting all fruits and vegetables from price control. This occurrence is borne out by Table 4, showing that a relatively larger number of families bought fewer potatoes more frequently in 1952 than during 1953 and 1954.

During 1953 data pertaining to quantity purchased became available for use. Table 5 shows the pounds of potatoes that were purchased throughout the seasons of 1953. The feature that is most outstanding about this data is the remarkable stability of quantity purchased

---

[2] K. P. Bemis and R. A. Seelig. "Fruit and Vegetable Facts and Pointers." United Fresh Fruit and Vegetable Association, Washington, D. C., November 1952.

during most of the year. The exception to this is between mid-August and late October when over 31 percent of the annual supply was purchased. This is the time of year when the late producing states such as Michigan are harvesting and marketing their crops. Promotion and merchandising of potatoes in large size units of purchase undoubtedly account for the larger average per capita quantity.

Table 5 also indicates that the average percent of families buying each week is considerably larger during the summer months than during the other three quarters of the year. With about the same quantity of potatoes being sold during the summer as during the rest of the year it becomes apparent that purchases are being made more frequently and in smaller quantities.

Since potatoes are most often merchandised and displayed by state of origin, the following discussion will make the distinction of potato origin. So that the study of display methods will also be facilitated, a table of distribution of potato sales by state of origin is presented. Table 6 shows the relative importance of each state's potato sales in Lansing throughout the four seasons of 1953. Michigan leads in potato sales during the entire year with the main spring and summer competition coming from California and the fall and winter competition from Idaho. Maine potatoes are relatively unimportant throughout the year with the highest proportion being only 5 percent during the winter months. Idaho's top sales also occur during the winter months when they reach 14 percent of the total sales. Michigan's dominance in potato sales points strongly to the need for Michigan retailers to carry and aggressively promote Michigan potatoes.

TABLE 6

TABLE OF RELATIVE DISTRIBUTION OF POTATO SALES BY STATE OF POTATO ORIGIN THROUGHOUT THE FOUR SEASON OF 1953*

State of Origin	1st Quarter		2nd Quarter		3rd Quarter		4th Quarter	
	Quantity Pounds	Quantity Percent	Quantity Pounds	Quantity Percent	Quantity Pounds	Quantity Percent	Quantity Pounds	Quantity Percent
Michigan	9,693	68	5,672	40	8,518	60	13,637	83
Maine	776	5	206	1	129	1	280	2
Idaho	2,023	14	869	6	584	4	1,109	7
California	90	1	3,058	22	2,486	18	13	..
Other	200	2	1,252	9	267	2	225	1
Don't know	1,353	10	3,165	22	2,088	15	1,126	7
	14,135	100	14,222	100	14,072	100	16,390	100

*Michigan State University Consumer Panel Data.

Table 6 provides further information on the fluctuation of potato sales during the year. The first three quarters of 1953 were noteworthy by their stability in total pounds of potatoes purchased by panel members. During the last quarter potato tonnage increased by over 15 percent compared with each other quarter of the year. Lack of seasonality among total potato sales during the first three quarters of the year is another reason for studying prepackaged size units from a state of origin basis.

Prepackaging and Size of Purchase

In studying the prepackaging size requirements for Michigan potatoes two tables of figures are necessary. Table 7 shows the distribution of Michigan potato purchases by size of the unit of purchase during 1953. Table 8 shows the variation in size of Michigan potato purchases and quantity purchased by method of purchase for three-four week periods in the first quarter of 1955. Table 8 became possible when in 1955 consumer purchase diaries were changed so as to reflect whether the consumer made her purchases in prepackaged or bulk form.

A look at the first quarter of 1955 (when method of purchase information became available, Table 8) shows that about three-fourths of the purchases and three-fourths of the Michigan potato quantity was purchased in prepackaged form. The 15 pound unit of sale was the most important prepackaged size, with about 60 percent of the purchases and 50 percent of the quantity of all Michigan potatoes being sold at that package size. Second in importance in terms of quantity purchased was the 50 pound unit. During the first quarter of the year the 50 pound paper bagged potato accounted for between 10 to 15 percent

TABLE 7

DISTRIBUTION OF FRESH MICHIGAN POTATO PURCHASES BY SIZE OF THE UNIT OF PURCHASES DURING 1953*

Size in Pounds	December 28, 1952 March 28, 1953		March 29, 1953 June 27, 1953		June 28, 1953 September 26, 1953		September 27, 1953 December 26, 1953	
	Percent of Purchase	Percent of Quantity	Percent of Purchase	Percent of Quantity	Percent of Purchase	Percent of Quantity	Percent of Purchase	Percent of Quantity
	Percent							
1 - 4	2.1	.4	1.8	.5	3.2	.5	2.4	.4
5	5.7	1.8	4.4	1.6	6.1	2.0	3.2	.8
6 - 9	1.6	.8	.9	.4	2.6	1.3	1.9	.8
10	14.3	9.1	34.0	24.5	28.4	19.0	9.8	4.9
11 - 14	.2	.1	.2	.4	.2	..	..	..
15	69.8	66.7	53.6	57.9	52.2	52.5	69.8	52.5
20	1.0	1.2	1.2	1.7	.5	.7	.6	.6
30	1.6	3.1	1.5	3.2	2.8	5.6	2.0	3.1
50	1.8	5.7	1.2	4.4	.5	1.8	2.3	5.9
60	.5	1.9	.5	2.1	2.3	9.2	3.8	11.4
100	1.5	9.3	.5	3.5	1.0	7.0	4.0	19.8
	100	100	100	100	100	100	100	100

*Michigan State University Consumer Panel Data.

TABLE 8

VARIATION IN SIZE OF MICHIGAN POTATO PURCHASES AND QUANTITY PURCHASED BY METHOD OF PURCHASE FOR THREE-FOUR WEEK PERIODS IN THE FIRST QUARTER OF 1955*

Size in Pounds	January 2, 1955 – January 29, 1955				January 30, 1955 – February 26, 1955				February 27, 1955 – March 26, 1955			
	Percent of Total Purchases		Percent of Total Quantity		Percent of Total Purchases		Percent of Total Quantity		Percent of Total Purchases		Percent of Total Quantity	
	P	B	P	B	P	B	P	B	P	B	P	B
	Percent											
1 - 5	1	1	..	..	..	2	..	..	2	3	1	1
6 - 9	..	2	..	1	..	2	..	1	..	2	..	..
10	13	2	8	1	10	3	6	2	6	3	4	2
15	59	14	50	12	60	15	54	14	57	17	51	14
25	1	..	2	..	..	..	1	..	1	1	1	1
30	1	..	2	..	1	1	1	2	3	..	6	..
50	4	..	13	..	3	..	9	..	4	..	13	..
60	..	1	..	3	..	1	..	2	..	..	..	..
100	..	..	..	..	..	..	..	3	..	..	..	..
180	..	..	..	..	..	..	..	5	..	1	..	6
300	..	1	..	8	..	..	..	..	..	..	..	..
	79	21	75	25	74	24	71	29	73	27	76	24

*Michigan State University Consumer Panel Data.

P means Prepackaged.

B means Bulk.

of Michigan potato sales. Of third importance in prepackaged form is the 10 pound unit size, which accounted for about 5 to 8 percent of Michigan potato quantity. The only bulk purchases that were of any consequence were the 15 pound size sales, which amounted to about 15 percent of all Michigan sales.

During the winter months Michigan retailers should carry the majority of their potato supplies in Michigan potatoes. These potatoes should be packaged in 10, 15, and 50 pound sizes. To encourage sales of larger units the price per pound should be adjusted on these three sizes so that the least per pound price is carried on the 50 pound package, then the 15 pound package, and finally the 10 pound size. This should help to encourage larger units of sale and at the same time it reflects the lower unit cost of handling large size packages. To those that may wish to buy less than a 10 pound size the retailer and his personnel should be ready to serve these customers needs by opening prepackaged bags and selling loose potatoes from them. This will not only serve these customers but will help build confidence in prepackaged potatoes.

It is interesting to note that a potato preference study conducted by the United States Department of Agriculture in 1948 showed that almost half of all those interviewed never bought prepackaged potatoes.[3] The reason most frequently mentioned was: "You can't see what you are getting." This feeling was expressed by about 40 percent of all housewives interviewed. Other frequently mentioned reasons were: "Can't

---

[3] "Potato Preferences Among Household Customers," United States Department of Agriculture, Miscellaneous Publication Number 662, 1948.

be bought in small quantities," "Not as good quality," and "Not available in stores." These comments indicate the necessity of making sure that all consumer packages of potatoes offered are of satisfactory quality. During the past seven years much of this objection to prepackaged potatoes seems to have been overcome. Panel data points out that about 75 percent of all Lansing purchases were prepackaged.

During the second quarter of the year there was little change in the relative position of each size of unit sale. Of course the actual Michigan potato sales are reduced because during the spring the last year's crop has usually been completely removed from storage stocks while the new crop does not come into harvest until late summer. Nevertheless Table 6 indicates that Michigan's relative position is at 40 percent tonnage of all potatoes sales during the spring. The principal exceptions compared to the winter quarter is that there is a relative increase in movement of the 10 pound unit. Table 7 shows that 34 percent of the purchases and 24.5 percent of the Michigan quantity was sold in 10 pound units during the second quarter compared with 14.3 percent of the purchases and 9.1 percent of the quantity during the first quarter. At the same time the 15 pound unit declined from 66.7 percent of the quantity to 57.9 percent of the quantity and the large size units of 50, 60, and 100 pounds also declined.

Reasons for the increased customer interest in the smaller 10 pound units seems to stem from one main factor. During the spring the last of the late potato storage stocks move into the marketing channels. In the late spring and early summer old potatoes tend

to shrivel rapidly and may if kept too long in the home become spongy and start to sprout. As total potato tonnage remains about the same it becomes evident that the customers are purchasing smaller sized units more frequently. Table 5 verifies this fact by indicating that on the average an additional 5 percent of the families made potato purchases every week during the months of April, May, June, July, and August then they do during the rest of the year.

The third quarter had several significant changes occur when compared with the second quarter. Table 7 points out that the main change was the increase in the large units of purchase. The 50, 60, and 100 pound units accounted for about 17 percent of the total quantity in comparison with 12 percent in the second quarter. This suggests that retailers should offer at least one of these sizes. The relative quantity of 10 pound and 15 pound sizes dropped 5 percent each compared with the second quarter. This decrease in small purchases was mainly the result of the increased sale of large units. The 30 pound sale size accounted for 5.6 percent of the Michigan quantity. Undoubtedly these sales were composed of two 15 pound units. It should be remembered that these are relative changes among the units themselves and that the actual tonnage of Michigan potatoes increased over the previous quarter.

The last quarter was the most important potato quarter in terms of total quantity purchased. Michigan sold more than 40 percent, more than any other quarter. The most important size was again the 15 pound unit, with more than 50 percent of the Michigan quantity being sold at that size. The largest increase in quantity sold occurred in the large units; the 50 pound, 60 pound, and 100 pound

sizes obtained 5.9 percent, 11.4 percent and 19.8 percent of the Michigan quantity respectively. The sizes the retailer should carry are the 15 pound size and the 50 pound unit. Customers who would buy the 100 pound unit could probably be expected to buy two 50 pound packages; likewise the 50 pound unit could serve as a substitute for the 60 pound or bushel size.

The California potato does not compete with the Michigan potatoes to the extent that Idaho, Maine, and other late state potatoes do. When Michigan potatoes are starting to disappear from the market in the spring, the California Long White potato starts to appear in the retail stores. Table 6 indicates that virtually no California potatoes are on the market during the first and last quarter of the year and for that reason a discussion of package size during these quarters will not be made.

During the spring the California potato was at a seasonal peak in sales with about 22 percent of all potato sales being realized by this state. Table 9 indicates about 75 percent of the purchases and 75 percent of the quantity is realized in the 10 pound package size, 7 percent of the quantity at the 15 pound size, and 6 percent of the quantity in the 1 to 5 pound range. This seems to indicate that a 10 pound package would be sufficient for food retailers. The present practice of merchandising the 10 pound size in open top tote bags has the advantage of permitting the customers to more easily obtain a smaller number of potatoes than 10 pounds if they so desire. However, when a tote bag is used, display signs should clearly indicate that the merchandise must be weighed.

TABLE 9

DISTRIBUTION OF CALIFORNIA POTATO PURCHASES BY SIZE OF THE UNIT OF PURCHASE DURING 1953*

Size in Pounds	March 29, 1953 June 27, 1953		June 28, 1953 September 26, 1953	
	Percent of Purchase	Percent of Quantity	Percent of Purchase	Percent of Quantity
1 - 5	11.7%	4.7%	8.4%	3.4%
6 - 9	1.3	1.0	.8	.5
10	77.6	75.9	74.0	70.8
11 - 14	1.0	1.3	.8	1.0
15	5.0	7.4	13.0	18.7
20	2.3	4.6	2.9	5.6
30	.7	2.0	...	...
100	.3	3.3	...	...
	100%	100%	100%	100%

*Michigan State University Consumer Panel Data.

In the summer California potatoes dropped to 18 percent of the total potato sales; this occurs because of the stream of the new Michigan potatoes onto the retail scene. Table 9 discloses that 71 percent of the California quantity is sold in 10 pound sizes, 19 percent in 15 pound units, and 6 percent in 20 pound units. Thus retailers should continue to carry the 10 pound size package. Although the 15 pound unit is responsible for about 19 percent of the California sales when it is compared with all potato sales this is less than 4 percent of the total potato quantity. Thus, the 15 pound unit in California potatoes appears to be unnecessary in a successful potato merchandising program.

In Lansing the Maine potato is quite unimportant in sales. Produced at the same time as the Michigan varieties it must face the

prospects of a higher transportation charge into Michigan stores than do Michigan potatoes. Essentially the Maine potato is the same type of potato that Michigan produces. For this reason, as Table 6 shows, less than 2 percent of the total potato quantity was sold during the spring, summer and fall. Maine potatoes do slightly better in the winter months when they attained 5 percent of the total sales. This appears to be the only time in which Lansing retailers would be justified in handling Maine potatoes.

Idaho potatoes are shipped during the entire year and offer competition to Michigan potatoes because of their excellent baking quality. They are most important in the first quarter of the year when they are responsible for about 14 percent of the total sales. During the second, third, and fourth quarter their sales were 6 percent, 4 percent, and 7 percent of the total potato sales. Because of their baking characteristics and the high customer acceptance of their superior quality, there appears to be a need for food retailers to sell Idaho potatoes during the entire year.

What should the proposed package size be to merchandise Idaho potatoes? Table 10 shows the variation in size of Idaho potato purchases and the quantity purchased by method of purchase for the three-four week periods in the first quarter of 1955. This table gives a detailed breakdown of purchase sizes by prepackaged and bulk purchases. Table 11 shows the distribution of purchase sizes of Idaho potatoes during each quarter of 1953. However, in this table no distinction is made between prepackaged and bulk purchases.

TABLE 10

VARIATION IN SIZE OF IDAHO POTATO PURCHASES AND QUANTITY PURCHASED BY METHOD OF PURCHASE FOR THREE-FOUR WEEK PERIODS IN THE FIRST QUARTER OF 1955*

Size in Pounds	January 2, 1955 January 29, 1955				January 30, 1955 February 26, 1955				February 27, 1955 March 26, 1953			
	Percent of Total Purchases		Percent of Total Quantity		Percent of Total Purchases		Percent of Total Quantity		Percent of Total Purchases		Percent of Total Quantity	
	P	B	P	B	P	B	P	B	P	B	P	B
	Percent											
1 - 5	5	12	3	6	7	8	3	5	5	12	3	5
6 - 9	..	..	..	..	..	1	..	..	..	2	..	3
10	67	12	71	13	69	8	72	8	64	13	68	14
15	3	..	4	..	6	1	10	2	2	..	3	..
20	1	..	3	..	..	..	..	..	2	..	4	..
	76	24	81	19	82	18	85	15	73	27	78	22

*Michigan State University Consumer Panel Data.

P means Prepackaged.

B means Bulk.

TABLE 11

DISTRIBUTION OF IDAHO POTATO PURCHASES BY THE SIZE OF THE UNIT OF PURCHASE DURING 1953*

Size in Pounds	December 28, 1952 March 28, 1953		March 29, 1953 June 27, 1953		June 28, 1953 September 26, 1953		September 27, 1953 December 26, 1953	
	Percent of Purchase	Percent of Quantity	Percent of Purchase	Percent of Quantity	Percent of Purchase	Percent of Quantity	Percent of Purchase	Percent of Quantity
	Percent							
1 - 5	10.6	3.8	19.7	9.4	17.6	8.0	19.5	7.8
6 - 9	1.0	.7	2.0	.8	1.6	1.2	4.1	3.1
10	81.8	84.5	71.9	79.4	75.8	80.5	69.7	76.6
11 - 14	.5	.7	..	..	..	..	.8	1.3
15	4.8	7.4	6.2	10.4	3.2	5.1	4.1	6.8
20	1.4	3.0	..	..	..	..	1.8	1.8
30	..	..	..	..	1.6	5.1	.8	2.7
	100	100	100	100	100	100	100	100

*Michigan State University Consumer Panel Data.

During the first quarter, Table 10 shows that from 75 to 80 percent of the purchases were prepackaged purchases while 80 to 85 percent of the Idaho potato quantity was sold in prepackaged form. Most all of the prepackaged sales were made at the 10 pound size unit. There appears to be little justification for selling any prepackage size other than the 10 pound unit. Since most of the bulk sales are also bought in 10 pound increments there should be several of the prepackaged bags open for customer inspection so that any fears of purchasing undesirable merchandise will be avoided. As for the rest of the year, the same practice seems desirable because Table 11 shows that from 75 to 80 percent of Idaho potatoes are sold in 10 pound sizes during the second, third, and fourth quarters. Because of the relatively small amount of total Idaho potatoes sales any sizes other than the 10 pound package would be unjustified.

Panel members also have two other choices in marking the state of potato origin. First they may mark potatoes that come from states other than the four previously mentioned. These other states represent an inconsequential amount of the total potato supply except during the spring months. Table 6 indicates that during this time the other states account for 9 percent of the total quantity. This is the time when some of the early potatoes from the southern states are shipped into Michigan. The last choice the panel members may indicate is "Don't know state." This represents a fairly important amount of the total potato supply. For example, Table 6 shows that 10 percent, 22 percent, 15 percent, and 7 percent of the supply is realized during each one of the quarters of the year. A look at Table 12 indicates the most popular size in the

TABLE 12

DISTRIBUTION OF ALL OTHER FRESH POTATO PURCHASES BY SIZE OF THE AMOUNT OF PURCHASE DURING 1953* [1]

Size in Pounds	December 28, 1952 March 28, 1953		March 29, 1953 June 27, 1953		June 28, 1953 September 26, 1953		September 27, 1953 December 26, 1953	
	Percent of Purchase	Percent of Quantity	Percent of Purchase	Percent of Quantity	Percent of Purchase	Percent of Quantity	Percent of Purchase	Percent of Quantity
	Percent							
1	..	..	..	..	..	..	1.0	..
2	..	..	..	..	..	..	1.0	..
3	..	..	..	..	..	..	3.2	..
1 - 4	14.9	4.0	12.9	3.9	11.3	3.0	7.3	1.8
5	27.6	13.6	18.5	10.1	13.7	6.9	13.7	5.8
6 - 9	1.2	.8	4.2	3.2	3.3	2.1	3.0	1.8
10	25.3	25.0	53.5	58.6	47.1	47.9	34.7	29.3
11 - 14	1.2	1.4	.9	1.3	.5	.6	..	..
15	26.4	39.2	7.7	12.6	22.2	33.7	35.8	45.3
20	2.3	4.5	1.7	2.7	1.4	2.9	2.1	3.5
60	..	..	.6	4.0	.5	2.9	1.0	5.3
100	1.2	11.4	.3	3.4	..	..	..	..
	100	100	100	100	100	100	100	100

*Michigan State University Consumer Panel Data.

[1]Includes potatoes from which the state of origin is not known.

first and last quarter of the year is the 15 pound size and in the second and third quarters the 10 pound unit is in predominance. Undoubtedly most of these potatoes come from the group of potatoes that have their state of origin in Michigan, Idaho, Maine and California. Without knowing the producing area it would be hard to draw any conclusions as to bag size for these potatoes. However, the larger number of 1 to 10 pound sized units of purchase indicates the fact that smaller quantities are more desirable in the spring and summer months. Both the old and early potatoes at this time of year are more subject to rapid deterioration.

Packaging Containers

Of interest to food retailers in the packaging and merchandising of prepackaged potatoes is the type of container material that has been most successful in selling potatoes. Consumer packages for potatoes are usually paper bags which provide little or no opportunity for inspection of the product at the time of purchase. Since visibility of contents appears to be a desirable feature of consumer packages for potatoes,[4] a test study was made in Maine to determine the customer acceptance of transparent plastic bags for potatoes and the problems connected with their use.[5]

---

[4] The study referred to on page 37 indicated that lack of merchandise visibility is a deterrent to selling prepackaged potatoes.

[5] A. Perry. "Plastic Bags for Potato Packages." University of Maine, Bulletin 514, 1953.

Since both Maine and Michigan market similar varieties of potatoes it seems that the results which were discovered in the Maine experiments should be adaptable to Michigan potato merchandising. Tests were run in several supermarkets in Bangor, Maine during the late fall of 1952 and early winter of 1953. Three containers were chosen for selling the 10 pound unit. These were as follows: (1) a regular mesh window paper bag, (2) a printed polyethylene bag, and (3) a slatted top corrugated box. U. S. Number 1 grade washed potatoes were used in this six week test. During the first two weeks all three containers were sold at the same price; this gave customers a chance to become acquainted with each package without the influence of price affecting the choice. In the following two weeks the price of each package was changed so as to reflect the container cost. During the final two weeks the price of the polyethylene package was increased by more than the container cost to determine what premium, if any, would be paid for potatoes packaged in this material. The results of this experiment are shown in Table 13.

Results from these test clearly indicate the demand by customers for product visibility in their selection of potatoes. The desire was strong enough that they were willing to pay a four-cent premium over and above the mesh paper window bag which only gives partial visibility. It seems if potatoes were priced at an amount which would cover the added cost of packaging in transparent bags that the retailer handling such potatoes would have overcome one of the roadblocks in selling packaged potatoes and would have at the same time added one more competitive merchandising tool to his stock in trade.

TABLE 13

CONSUMER ACCEPTANCE OF POLYETHYLENE AND MESH WINDOW PAPER BAGS AND CORRUGATED BOXES IN TWO BANGOR SUPERMARKETS FOR A SIX-WEEK PERIOD, 1952-1953 SEASON*

Sales Period	Type of 10-Pound Package		
	Poly-ethylene Bags	Mesh Window Bags	Corrugated Boxes
First 2-week Period Dec. 8-20, 1952			
Retail price per 10-pound package	59¢	59¢	59¢
Percent of test sales	63.5%	25.7%	10.8%
Second 2-week Period Dec. 22, 1952-January 3, 1953			
Retail price per 10-pound package	57¢	55¢	59¢
Percent of test sales	62.3%	33.3%	4.4%
Third 2-week Period Jan. 5-16, 1953			
Retail price per 10-pound package	59¢	55¢	59¢
Percent of test sales	54.0%	40.6%	5.4%

*Perry, op. cit., p. 5.

In this same study another experiment was conducted which should help to overcome resistance to potato sales. Conducted at the same time as the other experiment, only in different supermarkets, was a test to determine acceptability of washed and unwashed potatoes displayed next to each other in transparent plastic bags. During the first two weeks both packages were priced at the same amount, so that customers would be permitted to become acquainted with each package. During the next two weeks the price of the washed potato was advanced two-cents above the price of the unwashed so as to take into account

the additional cost of washing.[6] In the final two weeks the price of washed potatoes were increased four-cents above the 10 pound unwashed bag to determine how much of a premium the customer would pay for washed potatoes. Results of this six-week test are shown in Table 14.

TABLE 14

CONSUMER ACCEPTANCE OF WASHED AND UNWASHED POTATOES IN POLYETHYLENE BAGS AT TWO BANGOR SUPERMARKETS FOR A SIX-WEEK PERIOD, 1952-1953 SEASON*

Sales Period	Type of Potatoes	
	Washed	Unwashed
First 2-week period Dec. 8-20, 1952		
Retail price per 10 pound package	59¢	59¢
Percent of test sales	85.5%	14.5%
Second 2-week period Dec. 22, 1952-January 3, 1953		
Retail price per 10 pound package	57¢	55¢
Percent of test sales	76.8%	23.2%
Third 2-week period Jan. 5-16, 1953		
Retail price per 10 pound package	59¢	55¢
Percent of test sales	62.3%	37.7%

*Perry, op. cit., p. 7.

Even at a premium of two cents above the added additional cost of washing, customers showed their preference for washed potatoes by purchasing 62.3 percent of the supply compared to 37.7 percent for unwashed potatoes. The results of these sales demonstrate that cleanliness has high appeal value to consumers.

[6] Studies indicate the cost of washing potatoes are about 20 cents per hundredweight.

Also, of interest to potato merchandisers is the effect of certain family characteristics on the total quantity of potatoes purchased, the size of purchase, and the frequency of purchase. Such information should be of help in determining potential sales possibilities and directing the advertising and promotion efforts of those that are responsible for produce sales performance.

Relationship of Family Characteristics to Fresh Potato Purchases

Two methods are employed in studying the relationships that exist between family characteristics and fresh potato purchases. The first method is to study families that had different total purchases of potatoes and the second method is to study families that have different family characteristics. So that accurate yearly results could be obtained, only those families which reported 50 or more weeks were used. These 178 families were ranked into five equal groups according to the total family purchases and into five equal groups according to frequency of purchase. Then, these same families were classified into income groups and size of the family groups. Thus, this provides studies of families by differences in purchase behavior and studies of purchase behavior by differences in family characteristics.

In Table 15 the families were ranked into five equal groups based upon the quantity of fresh potatoes they purchased. It is interesting to note, even with such a staple item such as potatoes, the wide variance in quantity consumed per capita. The range in average quantity consumed per capita was 125.7 pounds down to 31.0 pounds per person. Those families that consumed the largest amount of

TABLE 15

DIFFERENCES IN FACTORS RELATED TO FRESH POTATO PURCHASES AMONG 178 M.S.U. CONSUMER PANEL FAMILIES GROUPED ACCORDING TO QUANTITY OF FRESH POTATO PURCHASES PER FAMILY IN 1953*

Data on Purchases and Family Characteristics	Rank in Fresh Potato Quantities Purchased Per Family				
	Highest 1/5 of the Families	Second 1/5 of the Families	Third 1/5 of the Families	Fourth 1/5 of the Families	Fifth 1/5 of the Families
Quantity					
Average quantity of potatoes per family (pounds)	578.3	306.6	208.6	131.3	55.6
Average quantity per person[1] (pounds)	125.7	91.8	67.7	52.7	31.0
Frequency					
Average number of purchases	31.6	22.1	17.3	11.2	8.5
Size					
Average size of purchase per family (pounds)	18.3	13.9	12.1	11.7	6.5
Average size of purchase per person[1] (pounds)	4.0	4.2	3.9	4.7	3.6
Family characteristics					
Average family income[2]	$5857	$5011	$5281	$4994	$3506
Average per person income[2]	$1398	$1584	$1801	$2024	$1770
Average size of family	4.60	3.34	3.08	2.49	1.79

*Michigan State University Consumer Panel Data.

[1]Based on meals eaten at home, 21 meals equaling one person.

[2]Based on 1952 income as reported on January 1, 1953.

potatoes per capita were the families that also had the highest average size families, the largest family income, but the lowest average per person income. These same families bought potatoes the most frequently and in the largest average sizes. The families that were the lowest purchasers of fresh potatoes were those families that had the smallest sized families, lowest family income, and medium per capita income. Also, the low purchase families were the families that bought potatoes the least often and in the smallest average size of purchase.

By grouping the families according to the frequency of purchase, a large range of average number of purchases was realized. Although the families that bought most frequently also bought the largest total quantities; they didn't buy in particularly large quantities when they did make purchases. Table 16 points out that the highest one-fifth of the families bought 36 times in a year and in average sizes of 13 pounds; while the medium family bought only 15.5 times in a year, but in an average of only 18.2 pounds. Families that buy most frequently tend to have larger families, larger family income, but the lower per capita income.

Next, the families were grouped according to family characteristics to determine to what extent, if any, family characteristics are related to purchases of potatoes.

By first grouping the families into three equal groups based upon per capita income it is possible to determine if any trends in purchasing are attributable to differences in income. The results of this classification are presented in Table 17. High income seems to be related to large quantities of potatoes consumed per capita. High

TABLE 16

DIFFERENCES IN FACTORS RELATED TO FRESH POTATO PURCHASES AMONG 178 M.S.U. CONSUMER PANEL FAMILIES GROUPED ACCORDING TO THE NUMBER OF WEEKS THEY PURCHASED FRESH POTATOES IN 1953*

Data on Purchases and Family Characteristics	Rank in Number of Weekly Purchases				
	Highest 1/5 of the Families	Second 1/5 of the Families	Third 1/5 of the Families	Fourth 1/5 of the Families	Fifth 1/5 of the Families
Frequency					
Average number of purchases	36.0	22.0	15.5	10.7	6.0
Quantity					
Average quantity per family (pounds)	469.9	272.9	282.3	168.2	84.8
Size					
Average size of purchase (pounds)	13.0	12.1	18.2	15.7	14.1
Family Characteristics					
Average family income[1]	$5820	$4964	$5069	$4764	$4046
Average per person income[1]	$1383	$1721	$1794	$1831	$1850
Average size of family[2]	4.46	2.94	3.09	2.80	2.01

*Michigan State University Consumer Panel Data.

[1]Based on 1952 income as reported on January 1, 1953.

[2]Based on meals eaten at home, 21 meals equaling one person.

TABLE 17

DIFFERENCES IN FRESH POTATO PURCHASES AMONG 178 M.S.U. CONSUMER PANEL FAMILIES GROUPED ACCORDING TO PER CAPITA INCOME 1953*

Data on Purchases and Family Characteristics	Per Capita Income Class		
	Highest 1/3	Middle 1/3	Lowest 1/3
Family Characteristics			
Average per capita income[1]	$2674	$1597	$894
Average family income[1]	$6134	$5080	$3607
Average size of family	2.2	3.2	3.8
Quantity			
Average quantity per family (pounds)	199.5	238.5	327.0
Average quantity per person (pounds)	90.7	74.5	86.1
Expenditure			
Average expenditure per capita[2]	$3.93	$3.54	$3.14

*Michigan State University Consumer Panel Data.

[1]Based on 1952 income as reported on January 1, 1953.

[2]Based on number of meals eaten at home, 21 meals equaling one person.

income families purchased about 5 percent more potatoes per capita than did the low income group, but 22 percent more per capita than medium income families group. The high income group purchased fewer potatoes per family than the other two income groups, however, the size of the family was considerably smaller. From the expenditures and quantity purchased per capita it can be determined that the

middle income group paid more per pound than did the other groups. Since the middle income group purchased the smallest quantity per capita it appears that income is neither directly nor inversely related to purchases of fresh potatoes. This data indicates that potatoes, although considered a low cost food, are not purchased in as great a quantity per capita by low and middle income families as is potentially possible. Promotion efforts might be directed in informing the customer of the high food value received for the small expenditure. Efforts might also be spent in carrying potatoes of two or more price lines. By carrying several lines; higher priced-higher quality potatoes could be used to attract high and middle income groups, while a lower priced-lower quality line might be used to attract low income families.

The last classification is based on families of different sizes. In Table 18 four classifications are used: (1) one person, (2) two persons, (3) three and four persons, and (4) five and more persons. Each group is not equal in number of families because at either extreme families are not as prevalent as the middle sized families. The families of largest size were not only the purchasers of the greatest amount of potatoes per family but were the largest purchasers per capita. Second, in purchases per capita was the family of two, third the family of three and four, and last the family of one member. The correlation between family size and purchases per capita seems to be direct at only the two extremes in family size with the middle sized families showing an inverse relationship. Purchases by the large families occur about every other week compared with the smallest sized

TABLE 18

DIFFERENCES IN FRESH POTATO PURCHASES AMONG 178 M.S.U. CONSUMER PANEL FAMILIES GROUPED ACCORDING TO SIZE OF FAMILY IN 1953*

Data on Purchases and Family Characteristics	Size of Family			
	One	Two	Three & Four	Five & Over
Number of cases	17	61	68	32
Family Characteristics				
Average size of family[1]	1.1	2.0	3.4	5.4
Average family income[2]	$1529	$4859	$5504	$5980
Average per capita income[2]	$1389	$2386	$1574	$1097
Quantity				
Average quantity per capita[1] (pounds)	65.9	86.0	76.4	97.5
Expenditure				
Average expenditure per capita[1]	$3.12	$3.86	$3.32	$3.56
Size				
Average size purchase per capita[1] (pounds)	7.9	5.8	3.7	3.6
Frequency				
Average number of purchases	8.3	14.7	20.4	26.8

*Michigan State University Consumer Panel Data.

[1]Based on the number of meals eaten in the home, 21 meals equaling one person.

[2]Based on the 1952 income as reported on January 1, 1953.

families buying only about every six weeks. Although the family of two members ranked second in purchases per capita they spent more in dollars per capita than the high quantity families, which indicates that the high consumption families paid a lower price per pound for their potatoes.

Since the relationships between family characteristics are not clear-cut precise conclusions cannot be drawn. The family of one person size consumes the smallest quantity of potatoes and has the lowest family income (next to the lowest per capita income). This suggests a line of potatoes which carries a relatively low price; also suggested, since this person is probably employed and has little time for meal preparation, is the adoption of a fresh potato that is easily and quickly prepared. This latter suggestion could only be adopted when technology develops a potato that can be pre-peeled and pre-cut so as to withstand quality deterioration. A higher priced and probably a higher quality potato seems to be preferred by the families of two, three, and four. A low price potato is purchased by the large families. This is probably the result of the low per capita income received by these families. Judging from the high frequency of purchase, potatoes would be a good item to feature in store advertisements which aim to create a price impression.

The high average size of purchase and relative infrequency of purchase which is a characteristic of small size families points out the necessity for retailers to have loose potatoes readily available for these customers. Low consumption should be coupled with smaller

sized purchases bought more frequently rather than the reverse. This would reduce home spoilage and enable the merchant to sell other produce items due to the increased potato patronage.

Summary

The potato is the top item in tonnage movement and usually highest in customer expenditure dollars. Years in which this is not true are years in which the potato supply is heavy and consequently the price is low.

In Lansing, the potatoes from Michigan are the most popular. The most important reason for this favorable position of Michigan potatoes is the lower cost involved in marketing them in Michigan. Panel data indicates that the Michigan potatoes were purchased in prepackaged form by over three-fourths of the customers during the winter months. Prepackaged size should be a 10 pound, 15 pound, and 50 pound with prices per pound adjusted downward as the bag size increases.

During the spring Michigan tonnage and relative position with other states decreases. Bag sizes should be the 10 and 15 pound size during the spring. More rapid deterioration of old storage potatoes and new potatoes is the reason for the customers more frequent purchases of smaller quantities. In the summer, Michigan tonnage increases over the second period and Michigan retailers should again adopt the larger size unit of either 50, 60, or 100 pounds. The last quarter is the most important Michigan potato quarter when tonnage was 40 percent more than any other quarter. The sizes retailers should carry are the 15 pound pack and either the 50 pound bag or bushel.

When Michigan potatoes are disappearing from the market, California potatoes are beginning to appear. During the spring this potato accounted for 22 percent of all potato sales. Since the 10 pound bag sold over 70 percent of the quantity, it is the only size retailers should carry during both the spring and summer. Idaho potatoes compete with Michigan potatoes during the entire year, however, they are most competitive during the winter. About 80 percent of the quantity were prepackaged sales. Most all of prepackaged sales were made at the 10 pound size unit. There appears to be little justification for handling any other prepackaged size.

Families that were the lowest purchasers of fresh potatoes were those families with the smallest sized families, lowest family income, and medium per capita income. These same families bought potatoes the least often and the smallest average size purchases. Families that buy most frequently buy on the average of 36 times a year but in smaller average sizes than those families that buy only half as often. Families that buy most frequently tend to have larger families, larger family income, but the lowest per capita income.

Purchases of potatoes are not positively related to income, although the highest income group purchased more potatoes per capita than did the other income groups. The correlation between family size and purchases of potatoes per capita seem to be directly related at the two extremes in family size with the middle sized families showing an inverse relationship.

From this data on family characteristics several conclusions can be drawn. First, there appears a need for customer education on the

low cost, high food value that can be derived from potatoes. Second, two price lines of potatoes should be carried. This would appeal to those that desire a higher quality of potato and are willing to pay a premium for quality and at the same time it would permit a low price competitive potato for appeal to those families that have low incomes. Third, the infrequent purchase of potatoes by small families, points out a need for retailers to make loose potatoes readily available to those customers that purchase only a small total amount of potatoes.

CHAPTER IV

PURCHASE PATTERNS AND CHARACTERISTICS OF FRESH APPLE PURCHASERS

"The bulk of the apple crop is purchased by consumers as fresh apples. Over three-fourths of the panel families' expenditure for apples were for fresh apples in 1952 and 1953."[1]

Fresh Apple Purchase Data

During the three years 1952, 1953, and 1954, apples ranked third among fruits and vegetables in consumer dollar expenditure, with $2.17 being spent per person in 1953 and with only slight variations from this amount in 1952 and 1954. This compares with a per capita dollar expenditure of $3.50 for potatoes and $3.25 for bananas, which ranked one and two, respectively. In terms of quantity consumed per person, apple purchases amounted to slightly over 25 pounds. For 1953, apples were purchased by an average of 24 percent of the families every week. This means that apples ranked seventh in this category, with head lettuce, bananas, potatoes, celery, carrots and oranges having a superior frequency of purchases.

There is, of course, considerable variation in dollar expenditure, quantity expenditure, and frequency of purchase by seasons of the year.

---

[1] J. D. Shaffer and G. G. Quackenbush. "Consumer Purchases of Apples." Michigan Agricultural Experiment Station, East Lansing, Special Bulletin 405, 1955, p. 7.

Table 19 depicts this information for the thirteen-four week periods of 1953.

As can be noted in Table 19, apple expenditure during the twelve week period from September 6, 1953, until November 28, 1953, was 37 percent of total annual dollar expenditure, while the quantity bought was almost 50 percent of the annual total. In contrast, during the twelve week period from May 17, 1953 to August 8, 1953, 7 percent of the yearly dollar expenditure was made and 5 percent of the total apple quantity was purchased. The month of October is the most important month for apple sales in both dollars and pounds. Purchases averaged about 5-1/2 pounds per person for four weeks or 21 percent of the annual purchases.

Results from a Michigan State University Consumer Panel Report reveal that the weighted average price for apples was also the lowest during this high purchase period.[2] For example, the average prices per pound in September, October, and November were $.066, $.057 and $.073, respectively. In contrast, during the low purchase period, from May 17, 1953, until August 8, 1953, average prices per pound were $.15, $.173 and $.10 for each four week interval. However, in using Michigan State University Consumer Panel price information the following limitations should be observed: (1) no distinction between grade or quality is made, (2) price difference between varieties is not reported, and (3) the sizes of purchase units will cause fluctuations in price per pound. Although price and the quantity purchased appear

---

[2] Ibid., p. 11.

TABLE 19

SEASONAL VARIATION IN QUANTITY, EXPENDITURE, EXPENDITURE RANK, AND FREQUENCY OF PURCHASE OF APPLES, 1953*

Time Period	Quantity Purchased Per Person	Expenditure Per Person	Expenditure Rank Among Fruits and Vegetables	Average Percent of Families Buying Each Week
	(pounds)			(percent)
Dec. 28, 1952-Jan. 24, 1953	2.00	$ .19	3	29
Jan. 25 - Feb. 21	1.49	.17	4	26
Feb. 22 - Mar. 21	1.98	.23	3	32
Mar. 22 - Apr. 18	1.07	.14	5	22
Apr. 19 - May 16	.97	.14	5	21
May 17 - June 13	.53	.08	8	13
June 14 - July 11	.13	.02	22	14
July 12 - Aug. 8	.55	.05	18	10
Aug. 9 - Sept. 5	1.54	.11	8	20
Sept. 6 - Oct. 3	3.73	.25	2	34
Oct. 4 - Oct. 31	5.45	.31	1	35
Nov. 1 - Nov. 28	3.19	.23	2	29
Nov. 29 - Dec. 26	2.72	.23	2	30
Annual	25.35	$2.15	3	24

*Michigan State University Consumer Panel Data.

to be related, there are undoubtedly other merchandising practices that influence purchases. For example, this same report points out that more purchases were made during the four week period following February 22, 1953, than during the four week period preceding that date, and at substantially the same price.

Another unique feature of the Michigan State University Consumer Panel data is the report of the percentage of families buying a particular commodity each week. Table 19 depicts this information for fresh apples during 1953. As can be noted, the variation in average percentage of families buying each week does not fluctuate as much as one would expect. However, Table 20 shows that differences in seasonal variations of expenditure between years seem to be related to the average percentage of families buying each week. For example, during the last four week period of the years 1952, 1953, and 1954, the seasonal variation in expenditure was $.18, $.23, and $.16 per person, respectively; during the same periods the percentage of families buying weekly was 25, 30 and 22 percent, respectively. It appears that if improved merchandising practices had been followed in December of 1952 and 1954 the expenditure for apples could have been increased.

One of the problems involved in the merchandising of fresh fruits and vegetables in prepackaged form is the selection of the most salable consumer units.[3] What would be the most desirable weight for packages

---

[3] Prepackaged merchandise involves the sale of items in film, carton, paper bag or in other types of unitized wraps. The distinction between prepackaged and self service should be made. A self-service produce department is not necessarily one that carries prepackaged items.

TABLE 20

YEARLY VARIATION IN EXPENDITURE PER CAPITA AND AVERAGE PERCENTAGE OF FAMILIES BUYING FRESH APPLES EACH WEEK DURING THE THIRTEEN-FOUR WEEK PERIODS OF 1952, 1953, and 1954*

Period	Expenditure Per Capita			Average Percent of Families Buying Each Week		
	1952	1953	1954	1952	1953	1954
I	$.19	$.19	$.19	31%	29%	29%
II	.18	.17	.22	32	26	35
III	.17	.23	.18	29	32	29
IV	.14	.14	.17	23	22	26
V	.09	.14	.12	16	21	21
VI	.03	.08	.08	6	13	14
VII	.02	.02	.04	3	4	7
VIII	.07	.05	.06	12	10	13
IX	.11	.11	.11	21	20	18
X	.23	.25	.24	36	34	34
XI	.40	.31	.35	42	35	43
XII	.23	.23	.28	29	29	32
XIII	.18	.23	.16	25	30	22

* Michigan State University Consumer Panel Data.

of apples--for example, 1, 3 or 8 pounds? Should the number be standard all year around? These are two of the questions that need answering so that operators may package quantities that will appeal to the largest number of customers and yet sell the largest possible quantities. A study of the sales distribution of apples should help in making these decisions.

Prepackaging and Size of Purchase

Table 21 depicts the relative importance of each unit of purchase in terms of frequency of purchase and quantity bought. During 1953, panel members were not required to indicate whether the purchases were in bulk or prepackaged form; thus, Table 21 is a combination of both types of purchases. The average size of purchase for the year was about 6-2/3 pounds and the total number of Michigan State University Consumer Panel members' purchases, on which this table is based, was 2,943. There is of course considerable variation in the distribution of size of purchase between the seasons.

During the last quarter of 1953, when the majority of apples reach maturity, the greatest number of apple purchases were made and the largest average purchases were realized. In contrast to the rest of the year, better than 40 percent of the apples were bought in larger than half-bushel sizes while a smaller percentage of the apples were bought in the smaller units. The most popular size in terms of number of customers buying was the 3 pound size, while the 4 and 5 pound sizes were second and third, respectively. However, the bulk of the apples were sold between 37 and 48 pounds, the bushel being the most important single size in that range.

TABLE 21

DISTRIBUTION OF FRESH APPLE PURCHASES BY SIZE OF THE UNIT OF PURCHASE, FOUR-THIRTEEN WEEK PERIODS*

Units of Purchases	December 28, 1952 – March 28, 1953		March 29, 1953 – June 27, 1953		June 28, 1953 – September 26, 1953		September 27, 1953 – December 26, 1953	
	Percent of Purchases	Percent of Quantity	Percent of Purchases	Percent of Quantity	Percent of Purchases	Percent of Quantity	Percent of Purchases	Percent of Quantity
(pounds)	percent							
1	5.1	1.0	5.9	1.6	5.6	.8	2.9	.3
2	14.8	5.7	26.0	14.3	19.0	5.7	9.2	1.9
3	23.0	13.4	31.9	26.5	18.5	8.3	18.1	5.6
4	26.8	20.7	16.8	18.6	17.3	10.4	18.0	7.4
5	10.7	10.4	5.4	7.4	5.2	4.0	16.2	8.4
6	6.9	8.0	6.7	11.0	11.3	10.2	9.5	5.9
7	1.0	1.3	.8	1.5	.4	.4	1.3	.9
8	1.7	2.6	1.7	3.8	1.2	1.4	2.1	1.7
9	.6	1.0	1.0	2.4	.8	1.1	.4	.4
10	1.4	2.8	.8	2.1	1.6	2.3	1.2	1.2
11 - 12	3.9	9.0	2.3	7.5	10.1	18.2	6.7	8.3
13 - 24	3.2	13.4	.8	3.7	9.4	24.4	7.0	16.2
25 - 36	.3	1.7	...	...	...	...	1.2	3.9
37 - 48	.6	5.1	...	...	1.6	1.2	4.5	22.3
49 - 72	...	...	...	...	.2	1.5	1.0	6.4
73 - 96	.2	4.1	...	...	...	...	.4	5.0
97 -120	...	...	...	...	...	...	.1	1.2
121 -144	...	...	...	...	...	...	.2	3.0
No. of purchases	904		523		515		1001	
Avg. size of purchase (lbs.)		5.17		3.61		6.64		9.68

*Adapted from J. D. Shaffer and G. G. Quackenbush, "Consumer Purchases of Apples," Michigan Agricultural Experiment Station, East Lansing, Special Bulletin 405, 1955, p. 13.

During the fall and winter of 1950, the New York State College of Agriculture conducted a study of merchandising practices in connection with New York State apples.[4] The objective of this work was to find those methods of retailing apples that were most effective in modern supermarkets. A number of merchandising practices were tested, such as the use of a bulk display, a display of prepackaged apples, and a display combining bulk and prepackaged apples; the use of different materials for prepackaging apples; and the practice of varying the size of units in which apples were priced and packaged. The results of this twelve week test (September 25 to December 16, 1950) are shown in Table 22.

TABLE 22

THE EFFECT OF MERCHANDISING PRACTICES ON APPLE SALES*

Merchandising Practice	Pounds Sold Per 100 Customers
Bulk display	
2 pound unit	11
4 pound unit	13
Prepackaged display	
4 pound cellophane bags	18
Bulk and prepackaged display	
2 pound cellophane bag and bulk	13
4 pound cellophane bag and bulk	20
4 pound polyethylene bag and bulk	23
6 pound polyethylene bag and bulk	28

*Davis, op. cit., p. 2.

---

[4] L. H. Davis. "Applying Improved Apple Merchandising Practices in Retail Stores." Cornell University Agricultural Experiment Station, A.E. 807, 1952.

These tests clearly show that a bulk display is not an effective method of selling apples in modern self-service stores. The most satisfactory method appears to be a combination of bulk and prepackaged displays, with the prepackaged apples displayed in 6 pound units with a polyethylene bag container. Although Michigan State University Consumer Panel data in 1953 do not make the distinction between methods of display or type of material covering, they do indicate size of purchase. As has already been mentioned, 37 to 48 pound units account for better than 22 percent of total apple sales, while 6 pound units account for slightly less than 6 percent of the total sales.

There are several reasons that would tend to account for this apparent discrepancy. First, large size units of apples were not tested, because many stores do not stock units of 10 pounds or more for an extended time during this thirteen week period. Second, combinations of the smaller sized units were not displayed. For example, 2, 4, and 6 pound units were not tested simultaneously. Third, only one variety, the McIntosh, was tested, while Michigan State University Consumer Panel data do not make such distinctions. Although not a discrepancy, the element of number of purchases was not tested. The 6 pound unit may sell more apples but at the same time the maximum amount of customers may not have been appealed to. The unit of size must not only be capable of selling a large quantity of apples, it must be a size that a large number of shoppers will purchase.

Based upon Michigan State University Consumer Panel data, several tentative conclusions can be drawn about size of prepackaged

unit for displaying during the last quarter of the year. In the smaller sizes (1 to 6 pounds) a variety of sizes from 3 through 6 pounds displayed with bulk seems to be most advantageous. These units could be packaged in transparent film and merchandised at a single price, such as 3 pounds for so many cents or 5 pounds for some other price. Since displays of between 1 to 6 pounds account for nearly 65 percent of the purchases, and 25 percent of the quantity, prepackaged units in these sizes would appeal to a large number of customers. There also appears to be a need for an intermediate size package of about 12 pounds, since almost 7 percent of the purchases are made at this unit size while 8 percent of the quantity is sold. Two larger size units are also needed: a half-bushel and a bushel size unit. Although a range of sizes is included in Table 21, an estimate of the combined sales potential of these two sizes would be about 10 percent of the purchases and 35 percent of the quantity.

Moving into the second most important quarter in terms of number of purchases, the period from December 28, 1952 to March 28, 1953, appears to contrast in several respects with the fall quarter. The 4 pound unit predominates as the most important single unit both in terms of percentage of purchase and percentage of quantity. In both these criteria the smaller sizes become more important than during the previous quarter. Examining the 1 through 6 pound units, it can be readily seen that they constitute better than 85 percent of all purchases and 60 percent of the quantity. At the same time the larger sizes diminish in importance. For example, the 37 to 48 pound size accounts for 5 percent of the quantity compared with 22 percent during the fall quarter.

Does this change in distribution pattern mean the retailer should change the package sizes he offers for display? To answer this question additional help can be obtained from viewing Table 23. Data became available in 1955 which distinguished the type of purchase into the two categories of bulk and prepackaged. Tabulations for the first twelve weeks of 1955 can be used as supplementary data for this particular period.

Approximately 55 percent of the purchases were made in the prepackaged form while 45 percent were purchased in the bulk form. This fact in itself points strongly toward the same conclusions reached in the New York study, in that apples displayed in both bulk and prepackaged form increased the pounds sold per 100 customers.[5] There are several reasons why apple sales can increase when consumer packages are added. It has long been recognized that additional items placed on sale in a grocery store increase total sales. Adding consumer packages to bulk displays of apples essentially adds another item for consumers to consider in making their purchases. Then there are always some shoppers in a hurry who do not want to wait for a produce clerk to weigh out apples from a bulk display. They find it more convenient to select a unitized package. Also, some customers like to know the exact cost of an item and a produce clerk seldom weighs out the exact amount of apples from a bulk display. Other customers like to select their apples from a bulk display. With both consumer packages and apples displayed in bulk, the retailer is more nearly able to satisfy everybody.

---

[5] Ibid., p. 2.

TABLE 23

VARIATION IN SIZE OF APPLE PURCHASES AND QUANTITY PURCHASED BY METHOD OF PURCHASE FOR THREE-FOUR WEEK PERIODS IN THE FIRST QUARTER OF 1955*

Size in Pounds	January 2, 1955 January 29, 1955				January 30, 1955 February 26, 1955				February 27, 1955 March 26, 1955			
	Percent of Purchase		Percent of Quantity		Percent of Purchase		Percent of Quantity		Percent of Purchase		Percent of Quantity	
	P	B	P	B	P	B	P	B	P	B	P	B
	Percent											
1	..	2	..	1	..	1	..	..	..	3	..	1
2	6	11	2	4	10	1	4	5	12	..	2	6
3	12	10	7	6	8	9	5	5	9	9	7	7
4	28	9	24	8	38	8	30	6	36	9	35	9
5	4	3	5	3	4	3	4	3	4	2	4	2
6	1	5	1	7	1	3	2	3	1	4	1	5
7 - 11	1	2	1	4	2	2	3	3	..	3	1	6
12 - 23	1	3	2	9	..	2	..	5	..	1	..	5
24 - 48	..	2	2	14	..	5	..	26	1	1	4	5
Total	53	47	44	56	57	43	45	55	56	44	54	46

*Michigan State University Consumer Panel Data.

P means Prepackaged.

B means Bulk.

During the first quarter of the year the percentage of prepackaged merchandise sold fluctuated from 44 to 54 percent of the total quantity. The most popular prepackaged size was the 4 pound unit, with the 3 and 2 pound units also being important. Very few prepackaged sales were made in large units. Although most retailers do not prepackage in units of over 8 pounds, it would be possible for consumers to make purchases of several smaller size packaged units at one time. The largest quantities of bulk apples are sold in the larger size units, namely, the bushel and half-bushel quantities.

From the data contained in Tables 21 and 23 the following recommendations can be made as to the sizes of apple displays to use during the first quarter of the year. A variety of sizes from 2 through 5 pounds offers the greatest potential, with the majority of sizes being packaged in the 3 and 4 pound units. An intermediate sized prepackaged unit might be eliminated or carried in only small numbers. The half-bushel, 24 pound size, seems to remain a good choice for continuance. The bushel size unit should be discontinued.

In a study to determine if Ohio apples could be given more competitive advantage by offering attractive units in two or three size units at the same time, Ralph W. Sherman and Glen H. Mitchell of Ohio State University determined that the offering of several sizes of bags of apples increased apple sales in the stores where they were offered.[6] The results of this study, conducted during the fall of 1951 and 1952, were very similar for the two years. In 1951, when 3, 5, and 10 pound

---

[6] R. W. Sherman and Glen H. Mitchell. "Sell Pre-Pack Apples in a Variety of Sizes." Progressive Grocer, January 1954, p. 92.

units were tried the statistical analysis showed that apple sales were increased by about 15 percent compared with when only one size (5 pounds) was used. The importance here is that it gives the retailer 15 percent more volume of apples while helping to lower his service cost. During the second year the combination was changed to include a 3, 4, and 8 pound pack. Substantially the same results were obtained in both years, with the exception that in 1952 the 8 pound package sold a slightly higher percentage of the total apple sales than had the 10 pound unit the year before. As a side light, a popular theory held among members of the retail trade was dispelled. It had always been believed that a large size unit with a high unit price would not sell. Contrary to this belief, it was found that the 8 pound unit with a price tag of over a dollar had no detrimental effect on the percentage of sales represented by the large bag.

The second quarter of 1953, in the Michigan State University Consumer Panel data, was characterized by a low number of purchases and the lowest average size of purchase. During this period panel members made 523 purchases which averaged 3.61 pounds per purchase. With the exception of about 4 percent of apples bought in the 13 to 24 pound range, there were virtually no apples bought in large amounts. Compared with the previous two quarters, there was an increasingly larger proportion of apples bought in 2, 3, 4, and 6 pound units. For prepackaging purposes a combination of small sizes should be used. A few intermediate size packages of 11 or 12 pounds might be successfully tried. It would be unnecessary to carry the large size bushel or half-bushel at this season.

In the third quarter of 1953 the smallest number of purchases were made, while average purchases jumped to 6.64 pounds per purchase. At this time of the year the early summer apples such as Yellow Transparent, Gravenstein, and Duchess make their first appearance. Since these varieties are primarily used for cooking and baking, the larger size of purchase, as indicated in Table 21, can partially be explained. Also the traditional fall favorites, Jonathan, McIntosh, and Wealthy, begin their way to market during September. A particularly strong favorite in terms of quantity was the range of sizes between 13 and 24 pounds. This undoubtedly means a large percentage of half-bushel sizes were purchased. Also important in quantity purchase was the 11 to 12 pound purchase which accounted for 18 percent of the total quantity. This strongly supports the contention that there is a need for a package of about 10 to 12 pounds. Again, the small sizes were popular for frequency of purchase, with the 2, 3, 4 and 6 pound units accounting for 65 percent of the purchases and 35 percent of the quantity. A variety of these small sizes would be ideal for packaging purposes.

A recent study by the United States Department of Agriculture confirms many of the conclusions drawn from the Michigan State University Consumer Panel data as pertains to bag size in the smaller units.[7] Also answered in this study is the often asked question, "What pricing unit should be used?" The study was conducted during the winter months in Pittsburgh, Pennsylvania. The findings indicated that more apples

---

[7]Anon. "Merchandising Studies in Supermarkets -- Apples, Lettuce and Tomatoes," Agricultural Marketing Service, United States Department of Agriculture, Washington, D. C., 1955.

were sold per 100 customers, using a display of plain polyethylene bags with weights varying from 2 to 6 pounds "catch-weight" in combination with bulk and based upon a 3 pound pricing unit.[8] Displays of a printed 5 pound polyethylene bag offered in combination with bulk and based on a 5 pound pricing unit resulted in the second largest quantity of sales. Table 24 depicts the four merchandising methods tested.

TABLE 24

QUANTITY OF APPLES SOLD PER 100 CUSTOMERS BY SPECIFIC METHODS IN 12 FOOD CHAIN STORES, PITTSBURGH, PENNSYLVANIA*

Merchandising Method	Sales Per 100 Customers
1. Plain polyethylene bags of weights varying from 2 to 6 pounds, in combination with bulk, and with a 3 pound price unit	10.75 lbs.
2. Printed polyethylene bags of 5 pounds in combination with bulk, and with a 5 pound price unit	9.90 lbs.
3. Plain polyethylene bags of weights varying from 2 to 6 pounds, without bulk, with a 3 pound price unit	9.78 lbs.
4. Printed polyethylene bags of 5 pounds, combined with bulk, and having a 5 pound price unit	8.92 lbs.

*Merchandising Studies in Supermarkets, op. cit., p. 3.

---

[8]"Catch-weight," a common term in retail trade usage, refers to package weights that are not predetermined, but are arrived at after the packages are filled.

Among the four methods tested a significant difference prevailed only between the first and last methods. The data indicated a strong preference for a choice of 2 to 6 pound "catch-weight" bags of apples offered at a 3 pound price unit. During these tests about 85 percent of the apples were sold in bags when a combination of bulk and bags was displayed, with the largest proportion of the small size packages being purchases in the 3 and 4 pound bags.

While it is impossible to tell from this United States Department of Agriculture study whether the adoption of these recommended size units would result in more apple sales for all retailers as a group, they are good enough competitively to force themselves into stores, and those stores adopting them first will benefit first.

Relationship of Family Characteristics to Fresh Apple Purchases

Of interest to produce merchandisers is the relationship that exists between family characteristics and the quantities purchased, the size of purchase, and the frequency of purchase. One of the methods by which this information can be obtained is to study the families that had different total purchases of fresh apples. Because of the seasonal nature of apple purchases, only those families which reported 50 or more weeks were used. These 178 families were ranked into five equal groups according to the quantity of apples they purchased. Table 25 summarizes the information on these five groups by factors that are believed to be related to consumption. Individual family purchases ranged from no purchases at all to 372 pounds, with the average purchase of the top one-fifth of the families being 200

TABLE 25

DIFFERENCES IN FACTORS RELATED TO FRESH APPLE PURCHASES AMONG 178 M.S.U. CONSUMER PANEL FAMILIES GROUPED ACCORDING TO QUANTITY OF FRESH APPLE PURCHASES PER FAMILY IN 1953*

Data on Purchases and Family Characteristics	Families Ranked by Number of Fresh Apple Purchases				
	Highest 1/5 of the Families	Second 1/5 of the Families	Third 1/5 of the Families	Fourth 1/5 of the Families	Lowest 1/5 of the Families
Quantity					
Average quantity of apples per family (pounds)	200	106	69	41	15
Average quantity per person[1] (pounds)	59	38	26	18	8
Average percent of total quantity	46.6	24.5	16.0	9.5	3.4
Frequency					
Average number of purchases[2]	20.2	14.6	13.3	10.0	4.7
Size					
Average size of purchase per family[2] (pounds)	14	10	7	5	5
Average size of purchase per person[2] (pounds)	4.1	3.5	2.8	2.1	2.4
Family Characteristics					
Average family income[3]	$5903	$4986	$4980	$4797	$4461
Average per person income[3]	$1648	$1566	$1736	$1808	$1964
Average size of family	3.8	3.4	3.1	2.8	2.3

*Adapted from J. D. Shaffer and G. G. Quackenbush, "Consumer Purchases of Apples." Michigan Agricultural Experiment Station, East Lansing, Special Bulletin 405, 1955, p. 15.

[1]Based on meals eaten at home, 21 meals equaling one person.

[2]Includes only those buying apples.

[3]Based on 1952 income as reported on January 1, 1953.

pounds contrasted with 15 pounds for the lowest one-fifth. There appears to be a direct relationship between the quantity of apples purchased per family and average size of purchase per family, average number of purchases, average size of family and, to a lesser extent, average family income. The families buying the smallest quantity of apples have fewer family members, the highest per capita income, but the lowest average family income.

Comparisons were also made by ranking the families according to number of weekly purchases and average size of purchases per family. This information is presented in Tables 26 and 27.

Families varied greatly in the number of times they made weekly purchases.[9] The range was from 0 to 42 times in a yearly period. The average number of purchases for the highest and lowest groups was 25.9 and 3.5, respectively. Those families buying most frequently tended to buy smaller quantities of apples per purchase, pay a higher price for apples, buy a total larger quantity, and to have larger families and family incomes, but a lower per capita income. The opposite characteristics prevail among the families that purchased a fewer number of times.

Ranking the families by average size of purchases vividly portrays the fact that quantity purchases are bought at considerably lower prices. There seems to be a direct relationship between average size of purchase and total quantity of apples that are purchased. There also appears to

---

[9] Each week's purchase is termed as a single purchase as panel data are reported on a weekly basis. This may tend to slightly underestimate the actual number of purchases.

TABLE 26

DIFFERENCES IN FACTORS RELATED TO FRESH APPLE PURCHASES AMONG 178 M.S.U. CONSUMER PANEL FAMILIES GROUPED ACCORDING TO THE NUMBER OF WEEKS THEY PURCHASED FRESH APPLES IN 1953*

Data on Purchases and Family Characteristics	Rank in Number of Weekly Purchases				
	Highest 1/5 of the Families	Second 1/5 of the Families	Third 1/5 of the Families	Fourth 1/5 of the Families	Lowest 1/5 of the Families
Frequency					
Average number of purchases[1]	25.9	16.0	10.4	7.1	3.5
Quantity					
Average quantity per family (pounds)	142	100	77	80	33
Size					
Average size of purchases[1] (pounds)	5	6	7	12	10
Price					
Average price[1] (cents)	11.0	9.8	9.8	8.3	9.0
Family characteristics					
Average family income[2]	$5650	$5357	$4954	$5080	$4066
Average per person income[2]	$1548	$1706	$1869	$1879	$1738
Average size of family[3]	4.0	3.3	2.8	2.9	2.4

*Adapted from J. D. Shaffer and G. G. Quackenbush, "Consumer Purchases of Apples." Michigan Agricultural Experiment Station, East Lansing, Special Bulletin 405, 1955, p. 19.

[1]Includes only those buying apples.

[2]Based on 1952 income as reported on January 1, 1953.

[3]Based on number of meals eaten at home, 21 meals equaling one person.

TABLE 27

DIFFERENCES IN FACTORS RELATED TO FRESH APPLE PURCHASES AMONG 178 M.S.U. CONSUMER PANEL FAMILIES GROUPED ACCORDING TO THE AVERAGE SIZE OF FRESH APPLE PURCHASES IN 1953*

Data on Purchases and Family Characteristics	Families Ranked by Average Size of Purchase Per Family				
	Highest 1/5 of the Families	Second 1/5 of the Families	Third 1/5 of the Families	Fourth 1/5 of the Families	Lowest 1/5 of the Families
Size					
Average size of purchase[1] (pounds)	20	8	5	4	3
Average size of purchase per person[1] (pounds)	6.7	3.3	2.2	1.5	1.4
Frequency					
Average number of purchases[1]	8.3	12.5	16.3	14.3	10.9
Quantity					
Average quantity per family (pounds)	154	102	88	57	31
Price					
Average price[1] (cents)	5.7	8.0	9.9	11.7	12.5
Family Characteristics					
Average family income[2]	$5060	$5346	$4737	$5374	$4580
Average per person income[2]	$1691	$1873	$1550	$1859	$1771
Average size of family[3]	3.2	3.0	3.2	3.4	2.6

*Adapted from J. D. Shaffer and G. G. Quackenbush, "Consumer Purchases of Apples." Michigan Agricultural Experiment Station, East Lansing, Special Bulletin 405, 1955, p. 19.

[1]Includes only those buying apples.

[2]Based on 1952 income as reported on January 1, 1953.

[3]Based on number of meals eaten at home, 21 meals equaling one person.

be an absence of a clearly discernible pattern between the average number of purchases, average family and per capita income, and average size of family.

To help in further determining if certain family characteristics are associated with apple purchases, two additional tables are presented. Table 28 ranks the families by three distinct income groups based upon per capita income rather than family income. Because per capita income presents a truer picture of a family's financial resources than does family income, that is the criterion that has been selected. Table 29 ranks the families by average size of family.

TABLE 28

DIFFERENCES IN FRESH APPLE PURCHASES AMONG 178 M.S.U. CONSUMER PANEL FAMILIES GROUPED ACCORDING TO PER CAPITA INCOME, 1953*

Data on Purchases and Family Characteristics	Per Capita Income Class		
	Highest 1/3	Middle 1/3	Lowest 1/3
Family Characteristics			
Average per capita income[1]	$2625	$1581	$963
Average family income[1]	$6016	$5148	$3877
Average size of family[2]	2.2	3.2	3.9
Quantity			
Average quantity per capita[2] (pounds)	29.6	33.9	23.6
Expenditure			
Average expenditure per capita[2]	$2.69	$2.65	$2.03

*Adapted from J. D. Shaffer and G. G. Quackenbush, "Consumer Purchases of Apples." Michigan Agricultural Experiment Station, East Lansing, Special Bulletin 405, 1955, p. 22.

[1]Based on 1952 income as reported on January 1, 1953.

[2]Based on number of meals eaten at home, 21 meals equaling one person.

TABLE 29

DIFFERENCES IN FRESH APPLE PURCHASES AMONG 178 M.S.U. CONSUMER PANEL FAMILIES GROUPED ACCORDING TO SIZE OF FAMILY, 1953*

Data on Purchases and Family Characteristics	Size of Family			
	One	Two	Three & Four	Five & Over
Number of cases	17	61	68	32
Family characteristics				
Average size of family[1]	1.1	2.0	3.4	5.4
Average family income[2]	$1529	$4859	$5504	$5980
Average per capita income[2]	$1389	$2386	$1574	$1098
Quantity				
Average quantity per capita[1] (pounds)	30.7	33.2	26.5	25.1
Expenditure				
Average expenditure per capita[1]	$2.56	$2.77	$2.28	$2.16
Size				
Average size purchase per capita[1] (pounds)	3.23	3.79	2.49	1.93
Frequency				
Average number of purchases	6.8	9.64	13.78	16.72

*Adapted from J. D. Shaffer and G. G. Quackenbush, "Consumer Purchases of Apples." Michigan Agricultural Experiment Station, East Lansing, Special bulletin 405, 1955, p. 22.

[1]Based on the number of meals eaten at home, 21 meals equaling one person.

[2]Based on 1952 income as reported on January 1, 1953.

On a per capita basis the middle income group bought more apples per capita but did not spend as much per capita as the top income group, which would suggest that those enjoying a higher income pay a higher price for the apples they consume than do middle income groups. The lowest income group was the lowest group in quantity of apples purchased and had the lowest expenditure; however, they tend to pay a little more per pound than do the middle income groups. It must be remembered that these are average figures for a particular group and that there is a large amount of variation within a group.

When families are grouped according to the size of family, there is a tendency for the large families to buy more apples per family, but a smaller number per capita. The larger families buy apples a greater number of times during the year and in large average sizes per purchase, but in smaller quantities per person. The families which consist of two persons are the leaders in average quantity per capita, average expenditure per capita, and average size purchase per capita. This indicates that probably married couples are the largest consumers of apples on a per capita basis. The larger size families, where children are members, do not consume as many apples on a per capita basis. Thus, children probably do not eat as many apples as adults. This offers an opportunity for produce merchandisers to increase apple sales by promoting apples among children.

Summary

Fresh apples rank third in terms of expenditure among all fresh fruits and vegetables. Apple sales are highly seasonal, October being the most important single month for apple purchases. Almost 50 percent

of all apples are purchased in over 10 pound units. Since most retailers do not handle such large unit quantities except for limited periods of time, it suggests the possibility that more retailers might attempt to carry a prepackaged apple unit of between 10 and 12 pounds, a half-bushel unit and a bushel unit during certain selected periods of the year. Unit size of apples should be varied so as to reflect the various seasons of the year. Varying the sizes of prepackaged apples from 2 to 6 pounds and displaying along with bulk apples at a selling price of 3 pounds offers the greatest opportunity for increasing apple sales.

In the Michigan State University Consumer Panel data, quantity was related to both frequency of purchase and size of purchase. The fifth of the families which bought the largest amount of apples also bought five times as often as the lowest purchase group and in average sizes which were almost three times as great. It would seem that extending the length of time that apples are available, thereby increasing frequency of purchase, might be another way of increasing sales.

Both the top and middle thirds of the families, based on income per capita, bought a larger amount and spent more per capita than did the low income group. However, income did not seem to be directly related to large purchases. Large size families bought larger quantities, in larger average size, and more frequently than did the smaller families. However, on a per capita basis the family of two members bought more apples. This would suggest that produce merchandisers could potentially increase apple sales by encouraging children to eat more apples.

CHAPTER V

PURCHASE PATTERNS AND CHARACTERISTICS OF FRESH ORANGE PURCHASERS

The orange is a fruit which has grown into prominence only within the past 45 years. Prior to 1910 only about 11 pounds of fresh oranges were consumed per capita. A peak was reached in 1944 when 45 pounds were consumed and since that time there has been a steady decline until only about 27 pounds are consumed today.[1] This decline in the fresh market is attributed to the tremendous gains made in the processing industry. Prior to 1915 less than 1 percent of the crop was processed. Today less than 50 percent of the crop is sold on the fresh market, while the trend appears that it will drop still farther. It is difficult to guess when and where the point of stability between fresh and processed will be reached.

Although fresh oranges have enjoyed a wide acceptance trend over the past 45 years it is interesting to note that about 5.5 percent of the panel families made no purchases during 1953. A study of consumer preferences for citrus products in Texas indicates that about 5 percent of the homemakers did not use fresh oranges.[2] Reasons most frequently

---

[1] R. A. Seelig, "Fruit and Vegetable Facts and Pointers," United Fresh Fruit and Vegetable Association, May, 1952.

[2] K. A. Fugeth, J. A. Bayton and H. W. Bitting, "Citrus Preference Among Customers of Selected Stores," Texas Agricultural and Mechanical College, Bulletin 722, 1950.

given for nonuse were: too much trouble to prepare the product, forbidden by doctor's orders, and dislike of the taste. This same study pointed out why orange consumption has enjoyed such a favorable trend.[3] Health promoting values that have been stressed by producer advertising has convinced many customers that oranges are beneficial as a means of preventing colds, as well as an abundant source of vitamins.

Oranges are available every day of the year but are most abundant from January through May. In general Florida starts the new crop year in October by marketing its early and mid-season varieties until the end of April. Starting in February the Valencia is sold until late July. The other important producing state, California, starts its season off with the famous Naval orange in November and then the Valencia in March and continues with the Valencia until November. Of secondary importance are Texas, Arizona, and Louisiana which market during the fall months until the early spring.

Fresh Orange Purchase Data

Table 30 shows the interrelationship that exists between expenditures per capita and average percent of families buying each week during the three year period of 1952, 1953, and 1954. 1953 was a year of relative high expenditure per capita compared to 1952 and 1954. The highest average percent of families buying each week in 1953 coincides with this higher expenditure. Comparing period with period it is interesting to note that in every period in which the expenditure per capita exceeds the like period in 1952 and 1954 that the average

---

[3] Ibid., p. 15.

TABLE 30

YEARLY VARIATION IN EXPENDITURE PER CAPITA AND AVERAGE PERCENT OF FAMILIES BUYING FRESH ORANGES EACH WEEK DURING THE THIRTEEN-FOUR WEEK PERIODS OF 1952, 1953, and 1954*

Period	Expenditure Per Capita			Average Percent of Families Buying Each Week		
	1952	1953	1954	1952	1953	1954
I	$ .17	$ .15	$ .17	28%	27%	28%
II	.18	.18	.19	28	31	33
III	.19	.19	.20	32	34	34
IV	.13	.18	.15	22	33	26
V	.15	.19	.18	27	34	28
VI	.13	.15	.14	23	26	23
VII	.10	.13	.12	18	21	19
VIII	.08	.11	.10	16	18	14
IX	.06	.08	.06	11	15	10
X	.06	.08	.06	11	14	10
XI	.08	.12	.09	14	21	16
XII	.09	.14	.12	18	25	21
XIII	.17	.18	.16	29	30	26
Total	$1.59	$1.88	$1.74	21%	25%	22%

*Michigan State University Consumer Panel Data.

percent of families buying each week also exceeded the same periods of 1952 and 1954; by the same token, periods in which the expenditure was below 1952 and 1954, the average percent of families buying each week was lower. Since the expenditure per capita and the average percent of families buying each week seem to be related, the increase in expenditure that takes place in one year over another year appears to be a function of promotion and merchandising effort as well as a function of price.

For a more detailed look at orange purchase data in 1953, Table 31 enumerates the quantity per capita, expenditure per capita, expenditure rank, and average percent of families buying each week during the thirteen-four week periods. About 52 oranges per capita are eaten each year at a cost of about 3.6 cents per orange. Oranges are purchased by an average of about 25 percent of the families each week. Of course there is a large seasonal fluctuation in families buying each week and quantity purchased. From the late fall until the late spring the bulk of the annual supply is purchased. For example, from December until mid-May about 60 percent of the total quantity is purchased. The average percent of families buying each week also varies, from a high of 34 percent to a low of 14 percent.

There appears to be several reasons for this increase in purchasing during the winter months and the sharp decline in purchasing during the summer. First, both Florida and California are in their peak harvest season during the winter and spring months; as the season progresses the quality of the fruit becomes poorer. Second, "seasonal needs," such as vitamins have become a necessity during the winter to aid in

TABLE 31

SEASONAL VARIATION IN FRESH ORANGE QUANTITY, EXPENDITURE, EXPENDITURE RANK AND FREQUENCY OF PURCHASE, DURING THE THIRTEEN-FOUR WEEK PERIOD OF 1953*

Time Period	Quantity Purchased Per Person	Expenditure in Cents Per Person	Expenditure Rank Among Fruits and Vegetables	Average Percent of Families Buying Each Week
		(cents)		(percent)
Dec. 28, 1952-Jan. 24, 1953	4.6	15	4	27
Jan. 25 - Feb. 21	5.6	18	3	31
Feb. 22 - Mar. 21	5.5	19	4	34
Mar. 22 - Apr. 18	5.1	18	3	33
Apr. 19 - May 16	5.0	19	3	34
May 17 - June 13	3.6	15	5	26
June 14 - July 11	3.2	13	8	21
July 12 - Aug. 8	3.1	11	10	18
Aug. 9 - Sept. 5	2.3	08	9	15
Sept. 6 - Oct. 3	2.0	08	9	14
Oct. 4 - Oct. 31	3.2	12	5	21
Nov. 1 - Nov. 28	3.8	14	5	25
Nov. 29 - Dec. 26	4.6	18	4	30

*Michigan State University Consumer Panel Data.

the prevention and cure of colds. Third, much of the seasonal variation is due to shifting to more preferred products which become available during the summer months. In a study conducted by the United States Department of Agriculture on consumer uses and opinions about citrus products the concensus of opinion seemed to be that the citrus and non-citrus fruits did not compete too greatly.[4]

Competition between citrus fruits and non-citrus fruits did not seem to be entirely dependent upon such matters as price, supply, and marketing methods. Consumers, in this study, considered citrus fruits as a special food class which was different and not part of the general line of fruits. However, this only seems to be true during the winter months. Oranges take a severe drop in expenditure rank during the summer months relative to the non-citrus fruits. Table 31 shows that during the summer oranges rank ninth and tenth in expenditure while during the winter they rank third and fourth. This change in expenditure rank position is partly the result of seasonally produced non-citrus fruit.

One of the controversies in orange merchandising is whether oranges should be priced and sold by the unit or by weight. And of more recent interest is the controversy that exists over whether oranges should be displayed and sold in loose bulk form or prepackaged form. And if in prepackaged form, what weight or count should be put in the bag so as to maximize both total sales and yet appeal to a

---

[4] Anon. "Consumer's Use of and Opinions About Citrus Products," United States Department of Agriculture, Agricultural Information Bulletin No. 50, 1951.

large number of customers? Answers to the above can in part be determined from the discussion that follows in the next two sections.

Pricing Method

Although panel data cannot be of help in answering the question as to whether pricing should be by weight or count a review of the history of the problem and the available pricing studies conducted should be helpful in appraising the preferences the customer shows toward these two methods.

The policies and regulations adapted by the Office of Price Administration during World War II were instrumental in familiarizing the buying public and retailers with the method of pricing bulk oranges by weight. Prior to that time, the pricing of oranges by count was prevalent among retailers throughout the Nation with the exception of the West Coast area where pricing by weight was introduced in the late 1930's.

At the expiration of Office of Price Administration controls, produce managers were faced with the problem of deciding whether oranges should be priced by weight or count. After decontrol, many retailers resumed selling oranges by count while others continued the weight-pricing method. With both methods of pricing being used, the question arises as to which is the better method for marketing efficiency and popular acceptance.

The customer, frequently confronted with more than one method of pricing, has little, if any, basis for determining which method is best suited to her needs. Custom and habit often play a strong role in influencing that buying decision. Undoubtedly in many instances whether the count or the weight method is used, the customer continues to make her selection on a unit basis, ignoring the pricing method used.

The United States Department of Agriculture thought that by conducting research in retail stores on the two methods of pricing bulk oranges--by count and by weight--it might be possible to determine if there exists any difference in potential demand for oranges resulting from alternate pricing methods.[5] The results of such a study would help the retailer determine which method of selling would be most compatible with customer desires.

Tests were conducted in four cities in the Northeastern section of the country. In three of the cities, oranges priced under both methods were placed in adjacent displays. In the fourth, city stores were equally divided into two groups, each groups using only one method of pricing. Cities were selected so that some of them were accustomed to pricing by weight, while the others were acclimated to pricing by count.

Data from sales records in the four week period indicated that where customers were given an equal opportunity to buy by count or by pound (3 cities) slightly more than two-thirds of the purchases were made on a count basis. Sales in stores located where there was not an equal opportunity to buy by count or by weight (1 city) showed that the customers offered some resistance to a change in pricing methods. Sales in stores selling by count were slightly larger than in those selling by weight, thus giving support to the conclusion that customers in that area have a preference for purchasing by count.

---

[5] E. D. Downie and H. R. Trienish, "Consumer Buying Practices and Preferences For Purchasing Oranges By Weight or Count, In Selected Cities," United States Department of Agriculture, Washington, D. C., 1950.

In all cities, more oranges were sold by the count-pricing method than by the weight-pricing method. However, this may have been due to force of habit and the lack of familiarity with weight pricing in some cities.

In interviews conducted with the customers, more than 70 percent of the total customers interviewed favored the count-pricing method. The study disclosed that principal reasons given were: (1) more for the money, (2) more understandable, and (3) habit.[6] When customers who purchased their oranges by the weight pricing method were questioned, the reasons they gave were: (1) more for the money, (2) appearance, and (3) better for purchase of small quantities.[7] Those that gave "appearance" as a reason believed oranges in that display looked better. However, this was not true, because oranges in all cases came from the same source and were of equal quality, price, and appearance.[8]

With these facts in mind the retailer must decide which pricing method for oranges is to his advantage. However, the conclusions that can be reached from this study strongly indicate that pricing by count is preferred by most customers. Aside from customer reaction there appears to be a definite advantage to pricing by count when the factor of time taken per sales transaction is considered. A retailer changing from pricing by weight to pricing by count will probably find some customer objection during the initial period. However, time must be allowed to familiarize the customer with the new method and to evaluate its merchandising merit.

---

[6] Ibid., p. 9.

[7] Ibid., p. 10.

[8] Ibid., p. 10.

Prepackaging and Size of Purchase

The more recent controversy in orange merchandising is whether oranges sell best in bulk displays or prepackaged displays or a combination of both. Allied with these questions is the farther query that pertains to the choice of bagged quantities. To gain further insight into this problem a review of the past studies is in order.

In the 1949 Texas study 76 percent of the users of fresh oranges preferred to buy the fruit in bulk rather than bags.[9] The main reasons for preferring the bulk were: (1) the opportunity to select fruit of better quality, and (2) the desire to be free to select the size and number of fruit needed. About 10 percent of the users had no preference while the remaining preferred the prepackaged form. Among the homemakers who indicated a preference for the prepackaged the reasons given for that choice were: (1) packaged fruit was less expensive, (2) fruit was easier to handle, while (3) only a small percentage said that the prepackaged fruit was of better quality.

Some customers reported a preference at the beginning of the season for fresh citrus sold in bags. As the season progressed the preference shifted to bulk displays as a means of selecting fruit free from poor keeping qualities, dryness, etc. A majority of the housewives who favored prepackaged oranges preferred to purchase them in 5 pound package sizes.[10]

---

[9] Fugeth, op. cit., p. 23.

[10] Ibid., p. 24.

In the United States Department of Agriculture study conducted in Louisville, Kentucky during 1948, most of the comparisons between it and the Texas study are quite similar.[11] About 70 percent bought and preferred to buy the loose bulk oranges, about 20 percent bought and preferred to buy the prepackaged oranges, and 10 percent stated no preference.[12] Among those who preferred bulk oranges, the preference for that choice seemed to be (1) quality of the fruit was better, (2) chance to see what they were buying, and (3) economy, because only the exact amount of fruit needed was bought. The prepackaged orange purchasers favored their method of buying because (1) convenience, (2) more economical, and (3) the quality of fruit was better. It was also interesting to note that in this study customers bought most frequently oranges which were purchased by count. Habit and the mistaken idea that purchases made by the pound resulted in poorer quality and inability to select the number or oranges needed, accounted for a majority preference buying oranges in units of a dozen or a part thereof.

In another study conducted by the United States Department of Agriculture in Los Angeles during 1950, essentially the same results were obtained in this study as in the previous two.[13] Again, pricing by count was the most popular of the two methods. Reasons for this

---

[11] Anon. "Citrus Preference Among Household Consumers in Louisville and Nelson County, Kentucky," United States Department of Agriculture, Washington, D. C., Information Bulletin No. 2, 1950.

[12] Ibid., p. 21.

[13] "Consumer's Use of and Opinions About Citrus Products," op. cit.

preference were: (1) habit, (2) exact number of fruit needed can be selected, (3) easier to learn cost, and (4) more convenient. The results of this preference are particularly noteworthy because of the predominance of pricing by weight on the West Coast.

These past studies point strongly toward a need for retailers to display oranges in a loose arrangement manner on either bins or display tables. Also pricing by the count seems to sell a greater quantity of oranges. One of the areas that these studies failed to investigate was the possibility of selling prepackaged oranges by count rather than weight. Since there was a strong preference for pricing by the count, perhaps greater prepackaging acceptance would have resulted if the bag had been sold by units instead of weight. A study of Michigan State University Consumer Panel data will be helpful in determining if the preferences that were shown in 1948, 1949, and 1950, are the same as in 1953 and 1955 or whether prepackaging had become popular enough to overcome the objections that existed toward its use during the earlier period.

Table 32 shows the variation in number of orange purchases and quantity purchased by size and method of purchase for three-four week periods in the first quarter of 1955. During the first quarter of 1955 the percent of total purchases ranged from 38 to 47 percent for the prepackaged oranges. The quantity purchased in prepackaged form ranged from 43 percent to 51 percent of the total quantity. Thus, over the past five years prepackaging seems to have overcome some of the customer objection that was previously incurred. However, about 60 percent of all purchases and 55 percent of the

TABLE 32

VARIATION IN SIZE OF ORANGE PURCHASES AND QUANTITY PURCHASED BY METHOD OF PURCHASE FOR THREE-FOUR WEEK PERIODS IN THE FIRST QUARTER OF 1955*

Size of Each Purchase in Units	January 2, 1955 January 29, 1955				January 30, 1955 February 26, 1955				February 27, 1955 March 26, 1955			
	Percent of Total Purchases		Percent of Total Quantity		Percent of Total Purchases		Percent of Total Quantity		Percent of Total Purchases		Percent of Total Quantity	
	P	B	P	B	P	B	P	B	P	B	P	B
	Percent											
1 - 5	..	6	..	2	..	6	..	1	.5	5.5	..	2
6	3	12	2	6	3	10	1	5	1	13	1	5
8 - 9	..	1	..	1	..	1	..	..	.5	..	..	..
12	30	38	31	39	37	29	35	29	35	33	33	31
13	..	..	..	..	1	..	1	..	..	..	1	..
18	2	1	4	2	..	1	..	1	1	1	3	2
24	3	2	5	4	7	6	13	11	4	4	7	8
30	..	..	1	..	..	..	1	1	..	..	..	..
36	..	1	..	2	..	..	..	1	.5	1	1	6
100	..	1	..	1	..	..	..	..	..	..	..	..
	38	62	43	57	47	53	51	49	42.5	57.5	46	54

*Michigan State University Consumer Panel Data.

P means Prepackaged.

B means Bulk.

quantity is still made in bulk form. On the basis of this evidence it still seems advisable for retailers to avoid a complete swing over to prepackaging. Rather they should feature both bulk and prepackaged selections together.

Turning to the size of purchase it can be readily observed from Table 32 that the dozen sized unit predominated in both prepackaged and bulk purchases and quantity taken. Between 60 and 70 percent of all oranges were sold at that unit of purchase. The next size in importance was the 2 dozen unit which accounted for between 10 to 25 percent of all quantity, with sales about equally divided between prepackaged and bulk. Almost all sales of less than a dozen were sold in bulk form; although these purchases only amounted to about 10 percent of the total quantity they did account for about 20 percent of the total transactions.

On the basis of these facts it seems desirable to feature both bulk and prepackaged merchandise. Two prepackage sizes are recommended; first, the dozen pack size and second, the two dozen pack size. The two dozen size would be particularly adaptable to merchandising smaller sized oranges and oranges that could be promoted at a seasonally low price.

Table 33 presents the variation in size of purchase and quantity purchased during the four-thirteen week periods of 1953. Data in this table are for an entire year, but it does not include method of purchase as does Table 32. The other three quarters of the year present about the same relative relationships between the sizes. Again the dozen size unit is the most popular in both transactions and total quantity

TABLE 33

VARIATION IN SIZE OF ORANGE PURCHASES AND QUANTITY PURCHASED DURING THE FOUR-THIRTEEN WEEK PERIODS OF 1953*

Size of Each Purchase in Units	December 28, 1952 March 28, 1953		March 29, 1953 June 27, 1953		June 28, 1953 September 26, 1953		September 27, 1953 December 26, 1953	
	Percent of Purchase	Percent of Quantity	Percent of Purchase	Percent of Quantity	Percent of Purchase	Percent of Quantity	Percent of Purchase	Percent of Quantity
	Percent							
1 - 5	5	1	7	1	6	1	9	2
6	19	8	18	9	21	10	22	11
8 - 11	2	1	2	1	..	..	1	1
12	54	46	60	60	55	52	54	52
18	2	3	2	2	1	1	..	2
24	13	22	9	18	15	29	12	24
30 - 36	3	8	2	7	1	3	1	3
48 - 60	1	3	..	2	1	4	1	5
100 - 200	1	8	..	..	..	..	..	..
	100	100	100	100	100	100	100	100

*Michigan State University Consumer Panel Data.

purchased. Second in importance is the two dozen size unit in terms of total quantity. Third in importance in terms of total quantity but second in importance in terms of number of transactions was the one-half dozen size unit. Although the same relative relationship exists between the sizes it would be remembered that the total quantity fluctuates between the seasons as indicated in Table 31. Thus, a retailer would package a dozen, and two dozen size unit during the entire year, but only in smaller total number during the summer.

Units of sale other than the one-half dozen, one dozen, and two dozen size are negligible. They are mainly in the three dozen size and other multiples of 12. However, in the fall there are some sales made in crate and half-bushel size units. The absence of odd numbered units indicates that very few oranges are sold by the pound such as 5 pounds or 8 pound bags.

Regardless of the type of display method that is followed the important factor of decision making in the store and its effect upon orange sales should be realized by all food retailers. According to the study by the United States Department of Agriculture, most housewives usually decide on the kind of citrus fruit they want before entering the store.[14] However, many of those housewives who had made these decisions changed their plans after entering the store. In most instances this change of plans is attributed to either one of two factors: (1) poor quality or appearance, and (2) higher price

---

[14] Ibid., p. 26.

than anticipated for the quality on display. This importance of quality of the fruit on sale was also demonstrated among those who usually waited until in the store, to decide what to buy.[15] Thus it appears that retailers need to be alert to the necessity of buying oranges of good quality and condition, handling them carefully while in storage, and policing displays so as to weed out culls and decayed fruit.

Relationship between Family Characteristics and Fresh Orange Purchases

Of interest to produce merchandisers is the relationship that exists between different quantities of apples bought by families and the family characteristics of those families. Also of interest to the produce merchandiser is whether income or size of family is related to orange purchases. Armed with such information the merchandiser is in a better position to aim his advertising message and promotion effort at those customers or potential customers that are most likely to cause an increase in orange sales.

In order to show who the families are that are responsible for both high and low total quantity purchases; and the families that buy most frequently, two tables of data are presented. In the first table (Table 34) families who purchased oranges were divided into five equal groups based upon the quantity of oranges they purchased per family. In the second table (Table 35) families who purchased oranges were divided into five equal groups based upon the frequency with which they purchase oranges.

---

[15] Ibid., p. 26.

TABLE 34

DIFFERENCES IN FACTORS RELATED TO FRESH ORANGE PURCHASES AMONG 168 M.S.U. CONSUMER PANEL FAMILIES GROUPED ACCORDING TO THE QUANTITY OF FRESH ORANGES PURCHASED PER FAMILY IN 1953*[1]

Data on Purchases and Family Characteristics	Families Ranked by Number of Fresh Orange Purchases				
	Highest 1/5 of the Families	Second 1/5 of the Families	Third 1/5 of the Families	Fourth 1/5 of the Families	Lowest 1/5 of the Families
Quantity					
Average quantity per family	469	222	121	65	17
Average quantity per capita	138	63	46	20	6
Frequency					
Average number of weeks purchased[1]	30	18	13	7	2
Size					
Average size of purchase per family	15.4	12.6	9.2	8.8	8.1
Average size of purchase per capita	4.5	3.5	3.5	2.7	3.0
Family characteristics					
Average size of family[2]	3.4	3.5	2.6	3.2	2.7
Average family income[3]	$5672	$5212	$4306	$4941	$4718
Average per capita income[3]	$1892	$1556	$1708	$1679	$1797

*Michigan State University Consumer Panel Data.

[1]Based on only those families buying oranges.

[2]Based on number of meals eaten at home, 21 meals equaling one person.

[3]Based on 1952 income as reported on January 1, 1953.

TABLE 35

DIFFERENCES IN FACTORS RELATED TO FRESH ORANGE PURCHASES AMONG 168 M.S.U. CONSUMER PANEL FAMILIES GROUPED ACCORDING TO THE NUMBER OF WEEKS THEY PURCHASED FRESH ORANGES IN 1953*[1]

Data on Purchases and Family Characteristics	Rank in Number of Weekly Purchases				
	Highest 1/5 of the Families	Second 1/5 of the Families	Third 1/5 of the Families	Fourth 1/5 of the Families	Lowest 1/5 of the Families
Frequency					
Average number of weeks purchased[1]	32.8	18.7	11.4	6.1	2.0
Quantity					
Average quantity per family	446	214	139	74	21
Family characteristics					
Average size of family[2]	3.4	3.0	3.1	3.2	2.8
Average family income[3]	$5482	$4876	$5041	$4615	$4836
Average per capita income[3]	$1856	$1659	$1748	$1565	$1802
Size					
Average size purchase per family	13.6	11.4	12.2	12.2	10.7

*Michigan State University Consumer Panel Data.

[1]Based on only those families buying oranges.

[2]Based on number of meals eaten at home, 21 meals equaling one person.

[3]Based on 1952 income as reported on January 1, 1953.

According to data presented in Table 34 there was a large range in average purchases among different families. This range on a family basis was from 469 oranges to 17 oranges. There also was a direct relationship between quantity purchased and frequency of purchase and size of purchase. The highest one-fifth of the families bought oranges most frequently and in the largest average size per purchase. The second one-fifth bought the next most frequently and in the next largest average size per purchase and so on down the line to the lowest one-fifth. There seem to be no particular patterns of family characteristics that are associated with quantity purchases. The most that might be said is that the families with high quantity purchases were also the families having the highest average family income and the highest average per capita income; however, the reverse was not true. The families who bought the smallest quantities did not have the lowest income. It appears from this table that there was a slight tendency for larger families to buy the largest quantities.

Table 35 shows the frequency of purchase range between the five groups of families ranked according to the average number of weeks they purchased oranges. There was a considerable drop in frequency between the highest one-fifth who made purchases 32.8 times a year and the second one-fifth who made purchases 18.7 times a year. Frequency of purchase was associated with quantity purchased per family; for example, the highest one-fifth bought 446 oranges while the lowest one-fifth bought only 21 oranges a year. Although there is no definite pattern in regard to average size purchase per family, the most frequent

purchasers did have slightly larger purchases than the other families. The highest one-fifth of the families had the largest family incomes and largest per capita income, but again the reverse is not true (the lowest one-fifth did not have the lowest income).

In order to determine if difference in purchases are the result of different family characteristics two additional tables are presented. In Table 36 families were grouped into three equal per capita income groups. In Table 37 families were grouped into four groups based upon the average size of the family.

TABLE 36

DIFFERENCES IN FRESH ORANGE PURCHASES AMONG 168 M.S.U. CONSUMER PANEL FAMILIES GROUPED ACCORDING TO THE PER CAPITA INCOME* [1]

Data on Purchases and Family Characteristics	Families Grouped Into Equal Income Groups		
	Highest 1/3	Middle 1/3	Lowest 1/3
Family characteristics			
Average per capita income[2]	$2665	$1593	$ 916
Average family income[2]	$6070	$5080	$3754
Average family size[3]	2.2	3.2	3.9
Quantity			
Average quantity per capita	88.0	62.6	46.9
Expenditure			
Average expenditure per capita[3]	$3.16	$2.18	$1.94

*Michigan State University Consumer Panel Data.

[1]Based on only those families buying oranges.

[2]Based on 1952 income as reported on January 1, 1953.

[3]Based on number of meals eaten at home, 21 meals equaling one person.

TABLE 37

DIFFERENCES IN FRESH ORANGE PURCHASES AMONG 168 M.S.U. CONSUMER PANEL FAMILIES GROUPED ACCORDING TO AVERAGE SIZE OF FAMILY* [1]

Data on Purchases and Family Characteristics	Size of Family			
	One	Two	Three & Four	Five & Over
Family characteristics				
Average size of family[2]	1.1	2.1	3.6	5.5
Average family income[3]	$1380	$4941	$5336	$6107
Average per capita income[3]	$1250	$2385	$1479	$1104
Quantity				
Average quantity per capita	71.6	89.0	49.1	49.6
Expenditure				
Average expenditure per capita	$3.18	$3.23	$1.80	$1.81
Size				
Average size purchases per person	6.2	6.4	3.8	2.6
Frequency				
Average number of weeks purchased	11.6	13.8	13.0	18.9

*Michigan State University Consumer Panel Data.

[1]Based on only those families buying oranges.

[2]Based on number of meals eaten at home, 21 meals equaling one person.

[3]Based on 1952 income as reported on January 1, 1953.

By grouping the families according to per capita income the range is from a high $2665 to a low of $916. The family size was largest for the low income group families and smallest for the high income group families. Thus, family income ranked in the same manner as per capita income. The quantity of oranges that are purchased per capita is directly related to per capita income. This range was from 88 oranges per year per capita to 47 oranges per year per capita. However, on a family basis, the middle income group purchased slightly more oranges than high income groups. Relationship between income and expenditure per capita is also direct. Even though per capita income is directly related to per capita quantity; families of all income groups buy about the same number of oranges per family. Thus size of family is a more important determinent in arriving at difference between family purchases than is income.

And last by grouping the families according to family size (Table 37); it is interesting to note that as the family size becomes larger the family income becomes larger, however, the per capita income is lowest for large families and highest for families of two members. Although larger size families consume more oranges per family than small families they consume only about five-ninths as many oranges per capita as the family of two members. Since most one and two member families are composed of adults and most three and more number families are composed of adults and children, the reduced purchase per capita of large families must be the result of low consumption on the part of children. The large families also buy more frequently but in smaller quantities per person.

The data on family characteristics as related to fresh orange purchase behavior has limited direct application to food retailing except for the part that advertising and promotion could play. To increase orange consumption children must be encouraged to use oranges in their diet as well as in the parent's diet. The theme of a produce advertisement might take the form of encouraging the parent to place an orange in the school lunch box or how oranges help to combat winter colds, etc.

Summary

The fresh orange is a fruit which has come into general use only during this century. The peak has been reached in consumption and a decline has already started to take place. This decline has been due to the phenominal growth which the processed orange has experienced.

Although fresh oranges have and still do enjoy a wide acceptance of use, it is surprising to learn that about 5 percent of the Lansing families bought no fresh oranges during 1953. In comparing orange purchases from year to year it was noted that increases in expenditure appear to be related to promotion and merchandising effort. On the average 25 percent of the families bought oranges each week. Thus, oranges are excellent feature items for advertising. A review of the studies of pricing methods revealed that when given a choice to select from a display priced by count and a display priced by weight the customer prefers to make her selection from displays priced by count. Aside from favorable customer reaction there appears to be a definite operating advantage to retailers when the factor of time taken per transaction is considered. Studies conducted several years

age definitely show that customers preferred selecting oranges from loose bulk displays. However, panel data in the winter quarter of 1955 revealed that about 40 percent of the purchases and 45 percent of the quantity is sold in prepackaged form. Retailers could best maximize their orange sales by displaying both prepackage and bulk oranges.

For prepackaging purposes the dozen size unit seems to be the favorite quantity that the customer purchased during the year. Due to the fairly large quantity sold in two dozen size units (about 22 percent) it seems advisable for retailers to also carry this sized units.

There is considerable difference between families in the amount of oranges they buy and the frequency with which they buy. Families that bought the greatest quantity had larger incomes and tended to have large families. The same family characteristics are also true for families that bought the most frequently.

When families were grouped according to per capita income and average size of family, it was discovered that there was a direct relationship between per capita income and total quantity purchased per capita. There was also a tendancy for large families to consume a much smaller quantity of oranges per capita than smaller sized families. Thus it was concluded that to increase total orange consumption through food retailer efforts it would be necessary for promotion and advertising to stress the need for oranges in the child's diet.

CHAPTER VI

PURCHASE PATTERNS AND CHARACTERISTICS OF FRESH GRAPEFRUIT PURCHASES

The grapefruit is a basic produce item on the market throughout the entire year; however it is most plentiful from October through May. Florida is the principal source of supply with Texas, Arizona, and California also shipping relatively large quantities of the fruit. Table 38 shows that virtually no grapefruit were sold in Lansing during the months of July, August, and September. Due to the small quantities shipped and the generally poor quality shipped during the summer months this item should be dropped from the food retailers stock list at this season.

Fresh Grapefruit Purchase Data

The expenditure per capita during the three year period (1952, 1953 and 1954) ranged from a low of 87 to 95 cents. Shown in Table 38 is the average percent of families buying each week. On a yearly basis the percent of families buying each week was quite stable for the three year period (approximately 14 percent). But due to the seasonal purchase pattern exhibited by grapefruit purchasers the 14 percent of the families buying each week becomes unrealistic and tends to hide the impact of the shopping behavior for the shorter time period. For example, in 1953 the range was from almost zero in the summer months to 29 percent of the families buying each week during February.

TABLE 38

YEARLY VARIATION IN EXPENDITURE PER CAPITA AND AVERAGE PERCENT OF FAMILIES BUYING FRESH GRAPEFRUIT EACH WEEK BY FOUR WEEK PERIODS OF THE YEAR*

Period	Expenditure Per Capita			Average Percent of Families Buying Each Week		
	1952	1953	1954	1952	1953	1954
I	11¢	11¢	11¢	21%	20%	25%
II	10	16	13	17	29	25
III	13	15	13	25	26	25
IV	12	13	11	24	24	22
V	10	10	8	20	18	17
VI	8	5	6	14	10	13
VII	4	2	3	6	6	7
VIII	a	a	a	..	..	..
IX	2	a	a	3	..	..
X	1	a	a	3	..	3
XI	5	5	4	10	12	10
XII	9	9	8	18	19	17
XIII	10	10	9	19	21	18
Total	95¢	96¢	87¢	14%	15%	14%

*Michigan State University Consumer Panel Data.

[a]Less than 1¢.

Part of the difference in expenditure per capita between 1953 and 1954 may be explained by differences in percent of families buying each week. Comparing like periods of 1953 and 1954 with each other reveals that there were more periods in 1953 than in 1954 when the percentage of families buying each week was greater. It is impossible without price and quantity information to determine the exact function price played in causing both the increased expenditure per capita and the increased number of families buying grapefruit each week. However, much of this increase must be due to differences in merchandising effort at both producer and retailer levels.

Table 39 gives a more detailed picture of the grapefruit purchasing behavior of the Lansing population during 1953. The average quantity consumed per capita was 12 grapefruit. The fluctuation in range of quantity purchased during the year was from a high of 2.6 grapefruit per capita during February to a low of practically none during the summer. Consumption starts again in the early fall when temperatures become more cool and the new harvest season begins.

Grapefruit consumption per capita is directly related to the number of families buying each week. From Table 39 it appears that increased purchases of grapefruit are most likely to occur by selling more families grapefruit over a longer period rather than by selling more grapefruit per family in the weekly period. Panel data indicates that grapefruit acceptance is far from universal. More than 16 percent of the families bought no grapefruit at all during 1953.

In the Texas study of citrus preferences, health promoting values and pleasing taste were the outstanding reasons given by

TABLE 39

SEASONAL VARIATION IN FRESH GRAPEFRUIT QUANTITY, EXPENDITURE, EXPENDITURE RANK, AND FREQUENCY OF PURCHASE DURING THE THIRTEEN-FOUR WEEK PERIODS OF 1953*

Time Period	Quantity Purchased Per Person	Expenditure in Cents Per Person	Expenditure Rank Among Fruits and Vegetables	Average Percent of Families Buying Each Week
		(cents)		(percent)
Dec. 28, 1952-Jan. 24, 1953	1.4	11	6	20
Jan. 25 - Feb. 21	2.6	16	5	29
Feb. 22 - Mar. 21	1.8	15	6	26
Mar. 22 - Apr. 18	1.5	13	6	24
Apr. 19 - May 16	1.0	11	7	18
May 17 - June 13	.5	5	12	10
June 14 - July 11	.2	2	21	6
July 12 - Aug. 8	a	..	..	..
Aug. 9 - Sept. 5	a	..	..	..
Sept. 6 - Oct. 3	a	..	..	..
Oct. 4 - Oct. 31	.6	5	9	12
Nov. 1 - Nov. 28	1.1	7	7	19
Nov. 29 - Dec. 26	1.3	10	6	21
	12.0	96	8	15

*Michigan State University Consumer Panel Data.

[a]Less than 1¢.

homemakers for the general acceptance of fresh grapefruit.[1] Consumers thought that fresh grapefruit was particularly good for children as a means of preventing colds. Taste, as well as health promoting values is one of the important attributes of citrus products. In this same study fresh grapefruit ranked second in taste preference among all forms of citrus products (fresh oranges ranked first).

With the fairly large percentage of non-grapefruit uses, as exists in the Lansing population, it should be helpful to merchandisers to understand the reasons for nonuse. Referring again to the Texas study of preferences it was pointed out that dislike of taste was the main hindrance to purchase of the product.[2] The unsatisfactory taste was usually expressed in terms of "bitter", "acid", and "sour". Another reason that appeared was the trouble that was necessary in preparing the item for use. Though little may be done by the retailer to correct the latter complaint, there is an opportunity to help overcome the objection registered against taste. By purchasing grapefruit of good quality and full maturity and then by handling and rotating grapefruit carefully the retailer will be aiding the situation by displaying a grapefruit that is not repulsive to the taste because of quality factors.

Similar to the controversy that exists over pricing and displaying methods with oranges is the controversy over these same merchandising techniques with grapefruit. Do customers prefer to buy fresh

---

[1] K. A. Fugeth, J. A. Bayton and H. W. Bitting. "Citrus Preferences Among Customers of Selected Stores." Texas Agricultural and Mechanical College, Bulletin 722, 1950.

[2] Ibid., p. 17.

grapefruit priced by unit or priced by count? Do customers prefer to buy fresh grapefruit in prepackaged or bulk form; and if in prepackaged form what weight or count should be placed in the bag so as to maximize sales and customer acceptance? Answers to the above can in part be determined from the following sections.

Pricing Method

Although panel data cannot be of help in answering the question as to whether pricing should be by weight or count, a review of the history of the problem and the available pricing studies conducted should be helpful in appraising the preferences the customer exhibits toward these two methods.

Familiarity with buying by the pound was gained by the customer during the time that regulations enforcing this method were adapted by the Office of Price Administration. As with oranges the only prior experience that the customer had with pricing by count was in the West Coast area, where this method of merchandising was introduced in the late 1930's.

Referring again to the Texas study on consumer preference on citrus purchases it was reported that 60 percent of the homemakers preferred pricing by count, 10 percent preferred pricing by weight, and 30 percent were indifferent as to the method.[3] The two major reasons for preferring the count method were: (1) a desire to select the exact number of fruit needed, and (2) it was more convenient. It was interesting to note that when most consumers were offered grapefruit priced by the pound that they still made their selection by the number desired.

---

[3] Ibid., p. 24.

In another citrus preference study using a cross sample of the United States it was determined that the direction of preference was for fresh grapefruit to be priced by count.[4] However, about one-third of the users indicated that they had no preference in this matter. Reasons given in this study for their preferences were slightly different than in Texas. Reasons most frequently given were: (1) that this was the method they were most accustomed to, and (2) pricing by count made the fruit less expensive because the exact number needed could be selected and at the same time bigger fruit could be bought.

It is most probable that habit is the most influential reason for a preference for buying grapefruit priced by count. The custom of planning the purchases of adequate quantities in terms of a specific number appears to be fairly deep-seated. The homemaker, knowing how many she is providing for, makes her estimate of quantity in terms of number of grapefruit. But there appears to be little logic in preferring any one number of units so long as the product can be selected by whatever criterion the shopper wishes to use, except that it may be more trouble to have it weighed. Also, the buyer may want to know at the time of selection just how much the fruit will cost, which may not be possible when pricing by weight. Then, probably habit and the mistaken idea that if they bought by the pound they would get poorer quality and could not select the number needed, accounted for the majority preference for buying

---

[4] Anon. "Consumer's Use of and Opinions About Citrus Products," United States Department of Agriculture, Washington, D. C., Agricultural Information Bulletin No. 50, 1951.

grapefruit in units of count. However, all of this is not to say that customers would necessarily buy a greater quantity of grapefruit if they were sold by count.

In view of the present day practice of increased shipments of grapefruit marketed in mesh bags priced by weight, a word of caution is necessary. Though in many instances these bags have had good acceptance in some stores, it still behooves the retailer not to merchandise these to the exclusion of grapefruit priced by count. As long as the customers' stated preference is for this pricing by count and there actions bear this out it seems probable that this should yield a higher volume of grapefruit sales for anyone store. Perhaps the Michigan State University Consumer Panel data, which is of more recent origin than the previously mentioned studies, will shed more light on this behavior. Turning now to the section on prepackaging, the previous question along with questions posed in the first section will be discussed.

Prepackaging

The more recent controversy in grapefruit merchandising is whether grapefruit sell best in bulk displays or prepackaged displays or a combination of both. And the second part of the same question is what quantities should be packaged at different seasons of the year if prepackaging seems desirable. As with oranges, a review of the history of the situation as it existed four or five years ago should be valuable. Then by studying Michigan State University Consumer Panel data, which is of the more recent origin, a comparison can be made.

In a study by the United States Department of Agriculture in Louisville, Kentucky there was an overwhelming desire for grapefruit that is displayed loose.[5] To the reply, "Were the grapefruit you bought already in a bag or loose, out of a bin?", 95 percent bought loose displayed grapefruit. When asked as to their preference about 90 percent stated they would prefer to buy loose displayed grapefruit and about 5 percent had no preference as to either method. The first series of reasons for this preference centered around the factor of quality. There was a feeling that if you bought prepackaged grapefruit you get a few poorer quality fruit and fruit of uneven size. The second series of reasons had to do with economy. The economy lay in the fact that this method was less wasteful because they could buy only the number they needed at any given time. Substantially the same results were obtained in the other United States Department of Agriculture study and the Texas study.[6]

These past studies point strongly toward the need for retailers to carry a supply of loose displayed grapefruit and to price these grapefruit by count rather than weight. However, it should be mentioned that during this period of time most of the prepackaged grapefruit was sold by weight. Whether this would have a bearing on the poor acceptance of prepackaged grapefruit or not was impossible to determine.

---

[5]Anon. "Citrus Preferences Among Household Consumers in Louisville and Nelson County, Kentucky," United States Department of Agriculture, Washington, D. C., Agricultural Information Bulletin No. 2, 1950.

[6]"Consumer's Use of and Opinions About Citrus Products," and "Citrus Preferences Among Customers of Selected Stores," op. cit.

A study of the Michigan State University Consumer Panel data will be helpful in determining if the preferences that were shown in 1948, 1949, and 1950 are the same as in 1953 and 1955 or whether prepackaging has become popular enough in the interim period to overcome the objections that prevailed in the earlier period. Table 40 shows the variation in number of fresh grapefruit purchases and quantity purchased at different units of sales for three-four week periods in the first quarter of 1955. The range in prepackaged sale of grapefruit was from a low of 42 percent to 49 percent of all grapefruit quantity. Thus it appears that over the past five years many of the objections formerly raised against prepackaged grapefruit have been dispelled. Nevertheless about 60 percent of the purchases and 55 percent of quantity is still purchased in bulk. On the basis of this evidence it still seems desirable to avoid a complete change over to prepackaged grapefruit. Rather it seems more appropriate to use both methods of display.

The question of number of units to put in a package must still be answered. Table 41 shows that the most popular size movement is the half dozen size. However four, five, eight units in bag also moved quite well. These same units were also popular in the bulk purchases with the further addition of two and three unit sales being made in large quantities. Undoubtedly the variance encountered in prepackaged units reflect to some extent the sale of grapefruit being realized at the pricing unit suggested on the price card. For example, 4 for --¢, 6 for --¢, or 5 for --¢, etc. It appears that there is no clear-cut number of units in a bag which sell decidedly

TABLE 40

VARIATION IN SIZE OF GRAPEFRUIT PURCHASES AND QUANTITY PURCHASED BY METHOD OF PURCHASE FOR THREE-FOUR WEEK PERIODS IN THE FIRST QUARTER OF 1955*

Size of Each Purchase in Units	January 2, 1955 January 29, 1955				January 30, 1955 February 26, 1955				February 27, 1955 March 26, 1955			
	Percent of Total Purchases		Percent of Total Quantity		Percent of Total Purchases		Percent of Total Quantity		Percent of Total Purchases		Percent of Total Quantity	
	P	B	P	B	P	B	P	B	P	B	P	B
	Percent											
1	..	2	..	..	..	1	..	..	..	2	..	..
2	2	11	1	5	1	11	..	4	1	8	..	3
3	3	15	2	9	3	17	1	10	1	22	1	13
4	7	14	6	12	5	9	4	7	5	6	4	5
5	4	8	5	9	7	5	7	5	8	5	8	5
6	11	6	14	7	11	15	13	18	13	9	15	10
7	1	1	1	1	1	1	1	2	..	..	..	..
8	4	1	1	2	4	3	7	4	10	2	14	3
9	1	..	3	..	..	..	..	..	1	..	1	1
10	3	2	6	5	2	3	4	7	3	3	5	6
11 - 13	3	1	6	2	1	..	3	1	..	..	..	2
14 - & up	..	..	3	..	..	..	2	..	..	1	1	3
	39	61	48	52	35	65	42	58	42	58	49	51

*Michigan State University Consumer Panel Data.

P means Prepackaged.

B means Bulk.

TABLE 41

VARIATION IN SIZE OF GRAPEFRUIT PURCHASES AND QUANTITY PURCHASED DURING THE FOUR-THIRTEEN WEEK PERIODS OF 1953*

Size of Each Purchase in Units	December 28, 1952 March 28, 1953		March 29, 1953 June 27, 1953		June 28, 1953 September 26, 1953		September 27, 1953 December 26, 1953	
	Percent of Purchase	Percent of Quantity	Percent of Purchase	Percent of Quantity	Percent of Purchase	Percent of Quantity	Percent of Purchase	Percent of Quantity
	Percent							
1	4	1	4	1	8	2	3	1
2	8	3	15	7	35	20	9	4
3	14	7	21	15	17	14	36	23
4	6	4	13	12	19	22	13	11
5	26	23	25	27	1	2	15	17
6	18	17	11	16	13	22	11	14
7	1	2	1	2	..	..	1	2
8	12	16	4	7	3	6	5	8
9	1	2	1	1	1	3	1	2
10	5	9	2	4	..	..	3	8
11	..	..	1	1	..	..	..	..
12	2	5	2	6	3	9	1	3
13 and over	3	11	..	1	..	..	2	7
	100	100	100	100	100	100	100	100

*Michigan State University Consumer Panel Data.

better than any other size unit. A retailer should change the number of units in a bag to fit a particular merchandising program. For example, if during one week he carried two sizes of grapefruit he might carry the larger size at a 3 for —¢ price and prepackage grapefruit of that size in units of three and units of six. The small size might be sold at 5 for —¢ and the grapefruit prepackaged in units of five and ten.

Table 41 presents the variation in size of purchase and quantity purchased during the four-thirteen week periods of 1953. Data in this table are for an entire year and does not include method of purchase as does Table 40. The spring and fall quarters of the year show approximately the same relationship between the sizes as the winter quarter. The only differenst of note is that there appears to be a tendency for larger units of purchase to be made in winter and smaller units of purchase to be made in the spring and fall. For example, during the winter quarter the three unit purchase accounted for 7 percent of the total quantity while during the spring and fall quarter the three unit purchase accounted for 15 and 23 percent respectively. This means that substantially the same merchandising program as suggested for the winter quarter might be adapted during the spring and fall, except for the downward shift in number of units in the fall and spring. As mentioned at the first of the chapter, the summer season accounts for a negligible amount of the total grapefruit sales. If any are handled at that time of year only token quantities should be ordered unless previous records for a particular store warrant otherwise.

Decision Making In Purchasing Grapefruit

The prior sections of this chapter contained a discussion of attitudes homemakers held toward the use of grapefruit and the merchandising technique used in selling this commodity. Also presented were data pertaining to customer behavior in purchasing grapefruit over a specified period. In this section data are presented on other aspects of the shoppers decision making process with respect to grapefruit.

In the United States Department of Agriculture study of the entire United States about 60 percent of the homemakers who used citrus products usually decided on the kind they wanted to buy before going to the store.[7] Thus most homemakers had made up their mind whether to buy grapefruit or lemons, or oranges, etc. before making the trip. However, relatively few of the homemakers said that store advertisements helped them decide upon the citrus product to buy or the store in which to buy them. Among those who did say the store advertisements influenced their decisions as where to buy grapefruit or other citrus, most were swayed by prices quoted, particularly specials. This means that most shoppers are not induced to shop at a particular store because of the attractive grapefruit price quoted in the advertisement. However, advertising grapefruit, especially when a large percentage of the families are buying them, helps add sales balance to a particular store advertisement. Thus, the single advertisement may not accomplish much by

---

[7] Ibid., p. 22.

itself but when added to the other feature items of the store it creates a low price impression and gives the shopper a reason for buying at a particular store.

Although many of the homemakers had decided on buying grapefruit before going to the store, on some occasions they changed their minds and did not buy as they had planned. In most instances this change of plans was attributed to the poor quality or appearance of the fruit; in other instances prices played a part in their decision. The importance of the quality of fruit actually on sale was also demonstrated by those 40 percent of the homemakers who made no decision to buy until they actually were in the store and then saw the fruit. In this latter group about 70 percent based their decision in the store on quality factors and for 30 percent the decisive factor was price. Probably in many cases it was interaction of price and quality which is that intangible factor referred to as value.

The attribute of the fruit used to make the quality evaluation was usually some aspect of the skin rather than weight, variety or size. The criteria used for evaluation is often contradictory to actual facts. For example, "Small grapefruit are best for juice", "A good fruit should have no blemishes on the skin", or "A bright yellow is the best." It seems that the color of the fruit is a primary factor in evaluating quality.

The implication of this study for the retailer are several in nature. First, "impulse buying" or buying after a visual check of the quality and appearance of produce is an important factor in purchasing citrus. The retailer must be constantly on guard in the

matter of quality preservation. He must purchase fruit that is in good condition and in the right quantities so that turnover time is reduced. He must follow handling practices that increase shelf life and finally he must follow merchandising practices that insure a complete and early turnover. Second, an educational program for customers on criteria for selection would be desirable. Such a program could be quite simple. It could use the direct method of in-the-store-salesmanship, or the indirect method of store talking signs or short institutional type copy in the produce section of the newspaper advertisement. To dispel some of the incorrect beliefs about surface appearances and their effect on quality should do much to reduce losses through markdowns and spoilage.

Relationship Between Family Characteristics and Fresh Grapefruit Purchases

Of interest to those responsible for merchandising produce is the relationships that exist between those who have different purchasing behavior and their family characteristics. Also important is the relationship between certain known family characteristics and those families purchasing behavior.

In order to show who the families are that are responsible for varying levels of total purchases and second the families that buy at varying frequencies two tables of data are presented. In Table 42 families who purchased grapefruit were divided into five equal groups based upon the quantity of grapefruit they purchased per family. In Table 43 families who purchased grapefruit were divided into five equal groups based upon the frequency with which they purchased grapefruit.

TABLE 42

DIFFERENCES IN FACTORS RELATED TO FRESH GRAPEFRUIT PURCHASES AMONG 148 M.S.U. CONSUMER PANEL FAMILIES GROUPED ACCORDING TO THE QUANTITY OF FRESH GRAPEFRUIT PURCHASED PER FAMILY IN 1953* [1]

Data on Purchases and Family Characteristics	Families Ranked Into Five Equal Groups				
	Highest 1/5 of the Families	Second 1/5 of the Families	Third 1/5 of the Families	Fourth 1/5 of the Families	Lowest 1/5 of the Families
Quantity					
Average quantity per family	146.7	50.2	24.9	13.4	5.1
Average quantity per capita	44.5	15.7	8.0	4.6	1.8
Frequency					
Average number of weeks purchased	22.3	10.5	7.4	4.0	1.9
Size					
Average size of purchase per family	6.6	4.8	3.4	3.4	2.7
Average size of purchase per capita	2.0	1.5	1.1	1.2	1.0
Family Characteristics					
Average size of family[2]	3.3	3.2	3.1	2.9	2.9
Average family income[3]	$5293	$5937	$4463	$4870	$4834
Average per capita income[3]	$1788	$2054	$1479	$1675	$1747

*Michigan State University Consumer Panel Data.

[1]Based on only those families buying grapefruit.

[2]Based on number of meals eaten at home, 21 meals equaling one person.

[3]Based on 1952 income as reported on January 1, 1953.

TABLE 43

DIFFERENCES IN FACTORS RELATED TO FRESH GRAPEFRUIT PURCHASES AMONG 148 M.S.U. CONSUMER PANEL FAMILIES GROUPED ACCORDING TO THE NUMBER OF WEEKS THEY PURCHASED FRESH GRAPEFRUIT IN 1953* [1]

Data on Purchases and Family Characteristics	Families Ranked Into Five Equal Groups				
	Highest 1/5 of the Families	Second 1/5 of the Families	Third 1/5 of the Families	Fourth 1/5 of the Families	Lowest 1/5 of the Families
Frequency					
Average number of weeks purchased	23.2	11.3	6.8	3.7	1.4
Quantity					
Average quantity per family	125.5	61.7	30.4	15.5	6.5
Size					
Average size purchase per family	5.4	5.5	4.5	4.2	4.6
Family Characteristics					
Average size of family[2]	3.2	2.9	3.1	3.3	3.0
Average family income[3]	$5548	$5223	$4578	$4540	$5531
Average per capita income[3]	$1871	$1885	$1646	$1386	$1965

*Michigan State University Consumer Panel Data.

[1]Based on only those families buying grapefruit.

[2]Based on number of meals eaten at home, 21 meals equaling one person.

[3]Based on 1952 income as reported on January 1, 1953.

According to data presented in Table 43 there is a range from a high average purchase of 147 grapefruit per family during a year to a low average of 5 grapefruit per family during a year period. There was a direct relationship between quantity purchased and frequency of purchase. The largest quantity consumers of grapefruit also bought greater amounts of fruit per purchase than the lowest quantity consumer. There seems to be no discernible pattern between the quantity of fruit purchased and the family income or per capita income. There is a slight tendency for the larger purchasers to have larger families; however the differences are probably too slight to be significant.

Table 43 shows the frequency of purchase range between five groups of families ranked according to the average number of weeks they purchased grapefruit. The range in frequency was from a high of 23.3 times in a year to a low average of 1.4 times in an annual period. The drop from the highest group to the second highest group was the largest. In that instance, the drop was an average of 12 purchases a year. Although the most frequent purchases were also the same families who also bought the largest quantities—they were families that bought in only slightly larger average numbers per purchase. The two top ranking families bought in only slightly larger number per purchase than the three lowest ranking families. There is no discernible pattern that shows a relationship between the family characteristics and frequency of purchase.

In order to determine if differences in purchases are the result of different family characteristics two additional tables

are presented. In Table 44 families were grouped into four groups based upon the average size of the family. The families that did not buy grapefruit during 1953 were excluded from the tabulation.

TABLE 44

DIFFERENCES IN FACTORS RELATED TO FRESH GRAPEFRUIT PURCHASES AMONG 148 M.S.U. CONSUMER PANEL FAMILIES GROUPED ACCORDING TO THE PER CAPITA INCOME* [1]

Data on Purchases and Family Characteristics	Families Grouped Into Equal Income Groups		
	Highest 1/3	Middle 1/3	Lowest 1/3
Family characteristics			
Average per capita income[2]	$2726	$1613	$910
Average family income[2]	$6196	$5402	$3635
Average family size[3]	2.2	3.3	3.8
Quantity			
Average quantity per capita	28.1	15.3	14.2
Expenditure			
Average expenditure per capita[3]	$2.05	$1.27	$1.21

*Michigan State University Consumer Panel Data.

[1]Based on only those families buying grapefruit.

[2]Based on 1952 income as reported on January 1, 1953.

[3]Based on number of meals eaten at home, 21 meals equaling one person.

By grouping the families according to per capita income the average per capita income was $2726, $1613, and $910, respectively,

for each group. The highest income families had the smallest family numbers. The highest income families bought about twice as much grapefruit per capita as the middle and lowest income groups. Thus, high per capita quantities is related to high per capita income. However, this large difference between groups is somewhat diminished when family purchases are considered. (There are larger average size families in the middle and low income groups.) Nevertheless, high quantity purchases seem to be associated with high income.

The last grouping is by average size of the family and the results of this grouping are shown in Table 45. Family income is largest for the largest sized family but is lowest on a per capita basis. The family composed of two members enjoys the largest per capita income. The family of two purchases twice as much grapefruit per capita as the next ranking group and consumes about 28 percent more on a family basis than the families composed of more than five. Undoubtedly the fact that the family of two enjoys the highest per capita income is an influencing factor in this high consumption. Since one and two member families are most likely to be entirely composed of adults and most three and more member families are composed of adults and children, the reduced purchases per capita of large families must be the result of low consumption on the part of children.

This section on relationships between family characteristics and fresh grapefruit purchases probably has limited application to food retailing except for the information that is provided on who is responsible for high and low quantity purchases of fresh grapefruit.

TABLE 45

DIFFERENCES IN FACTORS RELATED TO FRESH GRAPEFRUIT PURCHASES AMONG 148 M.S.U. CONSUMER PANEL FAMILIES GROUPED ACCORDING TO AVERAGE SIZE OF FAMILY IN 1953* [1]

Data on Purchases and Family Characteristics	Size of Family			
	One	Two	Three & Four	Five & Over
Family characteristics				
Average size of family[2]	1.1	2.0	3.8	4.8
Average family income[3]	$1281	$5154	$5705	$5946
Average per capita income[3]	$1147	$2481	$1550	$1103
Quantity				
Average quantity per capita	15.5	33.0	11.2	10.7
Average quantity per family	17.0	66.0	42.6	51.4
Expenditure				
Average expenditure per capita	$1.42	$2.53	$ .93	$ .82
Size				
Average size purchases per person	2.7	2.8	1.4	1.2
Frequency				
Average number of weeks purchased	5.8	11.7	8.1	8.9

*Michigan State University Consumer Panel Data.

[1]Based on only those families buying grapefruit.

[2]Based on number of meals eaten at home, 21 meals equaling one person.

[3]Based on 1952 income as reported on January 1, 1953.

This information could provide a basis for directing advertising messages. For example, it has been pointed out in these past tables that grapefruit consumption is lowest among families having children and families of lower per capita income. Thus, advertising might take the form of the low cost per serving during the peak harvest season or the nutrition available per serving, etc.

Summary

The grapefruit is a basic produce item on the market about eight months of the year. Virtually no grapefruit were sold in the Lansing area during the summer months of 1953. The percent of families buying each week during 1953 ranged from a low of zero in the summer time to a high of 29 percent in the peak month of February.

Grapefruit consumption per capita is related to the number of families buying. It appears that consumption is most likely to increase by selling more families grapefruit over a longer time period rather than selling more grapefruit per family in the short time period. More than 16 percent of the panel families bought no grapefruit at all during 1953.

Principal reasons for nonuse were unsatisfactory taste and excess amount of time in preparation. By careful selection, correct handling methods, and good merchandising techniques the retailer may partially overcome the former objection.

A review of previous studies showed that pricing by count was the pricing method preferred by customers. It is most probable that

habit is the reason for this preference. In view of the trend to do more merchandising by weight it still behooves the merchant not to exclude pricing by count.

Five years ago about 95 percent of the customers preferred to buy their grapefruit in the loose bulk form. However in 1955 about 55 percent of the customers preferred the bulk purchase method. Thus over the past five years many of the objections raised against prepackaging have been dispelled. It appears that there is no clear-cut number of grapefruit to place in a bag which sell decidedly better than any other size. Thus, a retailer should change the number of units in a bag to fit a particular merchandising program.

The decisions that the homemaker makes in the store is the important decision of whether to buy or not. Value or the interaction of quality and price together is the final determinents in making that decision. Planned purchases are frequently altered after the visual inspection is made.

Families that buy the largest quantities of grapefruit are families that are of small size and have large per capita incomes. Advertising to increase consumption should point out the low cost per serving and the health promoting values that it has for children.

CHAPTER VII

THE USE OF MICHIGAN STATE UNIVERSITY CONSUMER PANEL DATA AS RELATED TO SPECIFIC MERCHANDISING PRACTICES

In an economy of plenty, where growing and producing facilities are adequate to provide goods far in excess of those required to meet basic human food needs, consumer wants become highly important. Under these circumstances, customers can choose whether to buy or not to buy. It is here that information on purchase behavior becomes a vital element in providing merchandisers with facts on which to base merchandising decisions. Because customers need not buy items produced to satisfy wants, rather than needs, they can transfer their favors from one product to another or from one retailer to another. The informed merchandiser can hasten the acceptance for his produce and influence the stability of his returns by being cognizant of the shopping behavior of customers.

In the foregoing chapters the writer has discussed in some detail the usefulness of the Michigan State University Consumer Panel data as it pertains to a particular product. Also discussed in these commodity chapters were certain merchandising techniques and methods which are of current importance in marketing these products. It was discovered that Michigan State University Consumer Panel data had its greatest applicability in the area of package sizes for an individual commodity. But the question still remains: Are there other areas of usefulness for these data as applied to

the overall functions of retailing all produce (as opposed to individual commodities), and if so what are its limitations? Before discussing the individual functions it might be well to first look at the nature of these data and the form in which it would appear in after initial processing.

Nature of the Data

First, data may be presented for an individual commodity over an extended time period or for a brief time period. This is the type of data that were presented in the previous four chapters. Second, the data may be presented for a large number of commodities in a given time period. This is the type of data that will be used in this chapter. This second technique permits an examination of all commodities handled in a produce department at one time rather than a detailed examination of the single item. Relationships between items become more decipherable, and since many retailing functions must be analyzed from the complete department viewpoint rather than the individual segments, these types of data are necessary.

Table 46 shows the competitive relationships between the top twenty-five fresh fruits and vegetables from June 14, 1953 to July 11, 1953, and Table 47 shows the same relationship for the period July 12, 1953 to August 8, 1953, Table 48, August 9, 1953 to September 5, 1953, and Table 49, November 29, 1953 to December 26, 1953. For purposes of this chapter only these four four-week periods of the year need be shown. An examination of the tables shows that twenty-five items in the produce department account

TABLE 46

COMPETITIVE RELATIONSHIPS BETWEEN THE TWENTY-FIVE TOP FRESH FRUITS AND VEGETABLES, JUNE 14 TO JULY 11, 1953*

Expenditure Rank	Product	Quantity Purchased Per 100 Persons	Expenditure as Percent of Total Fresh Fruit and Vegetable Expenditure	Average Percent of Families Buying Each Week
1	Strawberries	151 quarts	19.4	36
2	Potatoes	538 pounds	9.8	42
3	Bananas	142 pounds	8.7	43
4	Muskmelons	71 each	6.6	41
5	Tomatoes	45 pounds	6.4	28
6	Head lettuce	97 heads	6.4	54
7	Watermelons	250 pounds	5.2	14
8	Oranges	320 each	4.7	21
9	Celery	37 bunches	3.8	26
10	Raspberries	22 quarts	3.1	7
Top 10			74.1	
11	Lemons	130 each	2.7	18
12	Cucumbers	55 each	2.2	22
13	Carrots	43 bunches	2.1	24
14	Mature onions	48 pounds	1.8	18
15	Sweet cherries	16 pounds	1.6	4
16	Cabbage	49 pounds	1.6	17
17	Radishes	68 bunches	1.5	24
18	Green onions	39 bunches	1.2	15
19	Peaches	17 pounds	1.2	6
20	Sour cherries	13 pounds	1.1	2
21	Grapefruit	22 each	.9	6
22	Apples	13 pounds	.8	4
23	Peppers	23 each	.7	11
24	Plums	10 pounds	.7	4
25	Asparagus	8 bunches	.6	4
Top 25			94.8	
All others			5.2	

*Michigan State University Consumer Panel Data.

TABLE 47

COMPETITIVE RELATIONSHIPS BETWEEN THE TWENTY-FIVE TOP FRESH FRUITS AND VEGETABLES, JULY 12 TO AUGUST 8, 1953*

Expenditure Rank	Product	Quantity Purchased Per 100 Persons	Expenditure as Percent of Total Fresh Fruit and Vegetable Expenditure	Average Percent of Families Buying Each Week
1	Raspberries	133 quarts	17.3	24
2	Potatoes	517 pounds	8.4	38
3	Bananas	137 pounds	7.9	43
4	Tomatoes	84 pounds	6.8	35
5	Muskmelon-cantaloupe	59 each	5.5	29
6	Sweet corn	362 ears	5.2	28
7	Head lettuce	70 heads	5.1	42
8	Peaches	94 pounds	4.6	26
9	Watermelons	205 pounds	3.8	11
10	Oranges	307 each	3.5	18
Top 10			68.1	
11	Blueberries	20 quarts	2.9	10
12	Celery	40 bunches	2.8	24
13	Sweet cherries	22 pounds	2.4	6
14	Lemons	123 each	2.3	17
15	Cucumbers	89 each	2.1	21
16	Carrots	47 bunches	2.0	23
17	Sour cherries	31 pounds	1.9	3
18	Apples	55 pounds	1.9	10
19	Mature onions	46 pounds	1.6	18
20	Snap beans	44 pounds	1.5	10
21	Cabbage	48 pounds	1.2	18
22	Radishes	48 bunches	1.1	17
23	Green onions	36 bunches	1.0	12
24	Plums	10 pounds	.8	4
25	Peppers	24 each	.7	10
Top 25			94.3	
All others			5.7	

*Michigan State University Consumer Panel Data.

TABLE 48

COMPETITIVE RELATIONSHIPS BETWEEN THE TWENTY-FIVE TOP FRESH FRUITS AND VEGETABLES, AUGUST 9 TO SEPTEMBER 5, 1953*

Expenditure Rank	Product	Quantity Purchased Per 100 Persons	Expenditure as Percent of Total Fresh Fruit and Vegetable Expenditure	Average Percent of Families Buying Each Week
1	Peaches	535 pounds	14.4	42
2	Potatoes	615 pounds	9.7	37
3	Muskmelons	98 each	9.6	37
4	Bananas	103 pounds	7.3	33
5	Tomatoes	273 pounds	7.3	29
6	Head lettuce	63 each	5.8	40
7	Sweet corn	447 each	5.6	27
8	Apples	154 pounds	4.5	20
9	Oranges	230 each	3.5	15
10	Blueberries	16 quarts	3.2	11
Top 10			70.9	
11	Watermelons	143 pounds	3.0	9
12	Celery	32 bunches	2.8	22
13	Cucumbers	166 each	2.4	13
14	Pears	89 pounds	2.2	6
15	Mature onions	67 pounds	2.1	14
16	Lemons	89 each	2.0	13
17	Grapes	20 pounds	1.8	9
18	Carrots	34 pounds	1.8	18
19	Peppers	64 each	1.3	12
20	Cabbage	47 pounds	1.2	16
21	Snap beans	18 pounds	1.1	7
22	Plums	13 pounds	.8	4
23	Radishes	22 bunches	.7	9
24	Green onions	18 bunches	.6	7
25	Squash	17 pounds	.6	6
Top 25			95.3	
All others			4.7	

*Michigan State University Consumer Panel Data.

TABLE 49

COMPETITIVE RELATIONSHIPS BETWEEN THE TWENTY-FIVE TOP FRESH FRUITS AND VEGETABLES, NOVEMBER 29 TO DECEMBER 26, 1953*

Expenditure Rank	Product	Quantity Purchased Per 100 Persons	Expenditure as Percent of Total Fresh Fruit and Vegetable Expenditure	Average Percent of Families Buying Each Week
1	Bananas	146 pounds	14.0	44
2	Apples	272 pounds	13.3	30
3	Potatoes	563 pounds	10.7	28
4	Oranges	465 each	10.4	30
5	Head lettuce	80 each	8.2	49
6	Grapefruit	131 each	5.8	21
7	Celery	30 bunches	5.5	30
8	Tangerines	270 each	4.9	18
9	Carrots	52 bunches	4.1	25
10	Grapes	23 pounds	2.5	10
Top 10			79.4	
11	Cranberries	15 pounds	2.1	11
12	Cabbage	45 pounds	1.8	15
13	Tomatoes	19 pounds	1.8	6
14	Mature onions	44 pounds	1.7	10
15	Sweet potatoes	22 pounds	1.6	7
16	Peppers	15 each	.9	7
17	Squash	25 pounds	.9	5
18	Radishes	13 bunches	.9	7
19	Cucumbers	14 each	.8	7
20	Lemons	24 each	.8	6
21	Spinach	4 pounds	.7	3
22	Turnips	14 pounds	.6	5
23	Brussels Sprouts	3 pounds	.5	2
24	Snap beans	3 pounds	.4	2
25	Green onions	6 bunches	.4	2
Top 25			95.3	
All others			4.7	

*Michigan State University Consumer Panel Data.

for the major share of the dollar volume. Also shown for the four-week period is the quantity consumer per 100 persons and second, the average percentage of customers buying the item in any one-week period. Armed with this type of data the discussion can now proceed to an evaluation of its merit in terms of applicability to certain merchandising functions.

Purchasing

One of the uses that might be made of this information is its use as a basic stock list for produce during each of thirteen four-week periods. It is realized that many stores carry more than these twenty-five items, but on the other hand there are probably many stores that do carry these twenty-five commodities let alone the different varieties and sizes of each item. Table 49 shows that the top ten items accounted for 79.4 percent of the sales and the next fifteen items accounted for an additional 15.9 percent of the sales. The question might well be asked: if ten items contribute almost 80 percent of the volume, why carry any more items? In other words, is there a case for variety?

As has been shown in these tables there are a few "old stand-by" fruits and vegetables that make up the bulk of the average retailer's sales, both dollar and volume wise. These staples--potatoes, head lettuce, tomatoes, celery, and carrots in the vegetable line; and bananas, apples, oranges, grapefruit, and strawberries in the fruit line make up roughly 65 percent of the dollar volume handled. These figures appear to build up a strong case for specialization.

But do these figures tell the whole story? Most of the better retail operators are convinced that they do not; and from the evidence that is available on consumer opinions, consumers appear to be glad that many retailers feel that way. There is sound evidence that consumers will make extra efforts to shop in stores that stock basic items and those seasonal specialties that add "spice" to the produce department.

Each commodity has its season, but the development of new varieties, the use of better cultural practices, and the more flexible marketing system have greatly broadened the base of availability. The modern fully stocked produce department should carry the basic twenty-five commodities for each period of the year and then add to that list depending upon space, customer preference, etc. A comparison of Table 47 with Table 49 shows that in the summer there were nine items in the list that did not appear on the winter stock list. Thus, a retailer can enhance his profits by promoting these seasonal items and at the same time encourage increased consumption of the standard items.

Retailers who have made produce displays a drawing card in their stores have found that sales have increased in other departments. This is a natural consequence of the increased trend toward "one-stop" shopping. On the other hand, those retailers who have relied on a few staples to carry the load have discovered the fairly direct relationship between the number of items stocked and the number of customers.

Often specialty items are in and out of season so quickly that certain retailers have discounted their importance. But while the highly seasonal items like raspberries may constitute less than a three percent of annual sales, it may account for as much as 17 percent of all fresh fruit and vegetable sales in one month. Cost and handling problems may be greater on such items, but so are the profit margins. Panel data shows that customers do buy these products readily and in significant volume.

Purchasing or ordering is the first step in the produce operation. Because of the perishable nature of the product every order is a risk, but it can be a carefully calculated risk. Instead of depending entirely upon his judgment in buying merchandise, the retailer should have an effective merchandise control system so that he will know which are his fastest and which are his slowest selling items. Such a system would help him to keep sufficient numbers of fast moving items in stock and avoid overstocking slow moving items. Panel data in the form presented in the tables can be used as a guide to estimating what items should be stocked and in what quantities. However, panel data would be a poor substitute for accurately maintained records of a particular store. For the day-to-day purchasing, sales must be estimated for the period covered by the order. Most good operators would use sales records for the previous week and adjust this to their expectations for the following week. Nevertheless, panel data indicates when a particular commodity is going to be in peak demand. These seasonal items represent short-term opportunities that must be anticipated and planned for in advance.

There are three limitations to using panel data as an aid in purchasing and they are centered around the general nature of the data. First, there are several factors that influence produce sales from week to week. The weather will not only affect the sales from week to week but will in many cases determine how long the item can be kept without spoiling. Peak supply and demand conditions do not always coincide from one year to the next. Promotion items that feature a low price will often change the movement of an item for a brief period. Competing prices and merchandising actions can change the sales picture for a store. In other words, panel data are not an accurate guide for day-to-day purchasing. However, where advance buying of carlot items is used the usefulness of the data are increased. When an order must be placed ten days prior to expected delivery, panel data provides a more accurate estimate of the expected movement, but its usefulness here is still limited.

The second limitation is one involving the limited applicability to any one store. Panel data are taken from a statistical universe composed of an entire metropolitan area. To the extent that any one store serves a neighborhood that is materially different in its food buying behavior from the statistical universe, the usefulness could be expected to be dissipated to that degree. Undoubtedly, certain nationality groups have buying behaviors that are unique to themselves. As pointed out under the four commodity chapters, income has some effect on what is or is not bought. And certainly class of store such as "supermarket", "superettes", and "mom and pop" stores could be expected to have different patterns of

produce sales. Nevertheless panel data shows what the customers are buying and what the overall potential sales could be. If these two limitations are kept in mind this data can serve as a useful guide for determining basic stock lists and as a guide for alerting the merchandiser to the forthcoming seasonal items.

The third limitation applies only to certain of the commodity items. To know that a certain number of apples are sold per capita and that they have a certain frequency of distribution is not enough in buying apples. It is necessary to know what varieties and sizes of apples are involved. Panel data does not provide this information because of the difficulty of reporting other than just the commodity involved. This limiation does not apply to lettuce, carrots, celery, etc., where the influence of variety and size are less important.

Advertising and Promotion

This section is not intended to present a detailed account of the principles or mechanics of retail advertising. What will be presented is a discussion and examples of how panel data can be used in selecting items to be advertised. The form that item selection advertisement would take is the direct action response as opposed to indirect action or institutional type. The purpose of the former type is to move goods out of the store by bringing people into the market in response to an advertisement. The forms that this advertising takes are several in nature but most are merely variations of price promotion. However, with fruits and vegetables the use of educational type advertising along with produce price advertising

is a fruitful area to break down prejudice against a product, promote intelligent buying, and to suggest new uses for a product.

Only by way of a thorough understanding of the customer, his nature, his motives, his appetites, and his desires, can an advertisement be written toward the customer. The customer is looking for mealtime ideas, for good things at reasonable prices, for household suggestions, for weekly specials, and for many individual wants and needs. In short, the operator must be capable of projecting his thinking so as to realize what people desire.[1]

In selecting items for advertising the operator should offer customers the items that they want at the time that they want them. This means choosing items that are timely because of season, holidays, local events, and national advertising of producers; items that have wide local appeal; items that are frequently purchased; and items that help to sell other items. Another factor that the operator should consider is variety. Inclusion of varied items in his advertisements broadens there appeal.

This is the area in which Michigan State University Consumer Panel Data can be helpful. A look at the top ten items in either Table 46, Table 47, Table 48 or Table 49 shows which items have wide appeal and are timely. The average percent of families buying each week in all tables reflects the frequency of purchase. To explain how this information might be used, a produce merchandising

---

[1] L. Javitch, J. Silverbury, and L. Stienberg. "A Comprehensive Study of Food Chain Newspaper Advertising." Unpublished Seminar, Michigan State University, 1954.

program for the summer months will be illustrated. The summer months were purposely chosen because they can be the most interesting and profitable months to the produce department. The department undergoes a radical change during the period from May well into September, and the produce man has to be quick to take advantage of all these changes. Perishability becomes more important, products are different, colors are more varied, harvest and season deals are more prominent. According to N. H. Bolstad of Von's Grocery Company, the four major summer promotions involve salad vegetables, berries, melons, and soft fruit.[2]

Coming into major supply throughout the country in May and continuing until early fall are the salad vegetables which offer the best opportunity for sustained promotions throughout the summer. Profits on these items are usually better than average and there colors lend themselves to salad-bowl-type of displays making it possible to build related item displays of dressings, cheeses, spices, etc. The salad-bowl vegetables can serve to perk up slow periods through their cool eye-appealing attractiveness. Tables 46, 47, and 48 show that head lettuce always makes an attractive drawing card because of its frequent purchase (range from 40 percent to 54 percent of the families buying each week). Lettuce featured with the other volume sellers such as tomatoes, celery, cucumbers, carrots, cabbage, green onions, and peppers

---

[2] N. H. Bolstad, "Freshness Keys Summer Produce," Chain Store Age, July 1955, p. 63.

are excellent for in-the-store promotions. As the home grown season arrives those items that are locally produced offer high volume possibility for the store and high value produce for the customers. Tomatoes are another good feature item; ranking high in quantity movement and frequency of purchase throughout the entire summer. In the Lansing area they hit there peak demand during August when home-grown supplies are on the market. According to the data celery and cucumbers would make good secondary feature items in the produce advertisement.

The second major summer promotion involves berries with July being a peak month for all berries except strawberries which reach a peak during June. According to Table 46 strawberries were first in expenditure rank with about 20 percent of the fresh fruit and vegetable dollar going toward their purchase. About 36 percent of the families bought strawberries each week and over a four-week period about one and a half quarts were purchased per person. During July more money was spent on fresh raspberries than any other fruit. Table 47 shows that 133 quarts were purchased per 100 capita in a four-week period and that about one-fourth of the families bought this fruit each week. Blueberries were the eleventh most important item in July. With berries many of the operators try to add novelty to their department by buying on the early season markets. This means that the berries must be top quality for in most cases the price will be higher and the appeals must be in quality, freshness, and uniqueness. In Michigan it would be desirable to feature berries when they first arrive on the market and then follow them through the season climaxing the season with a peak of the harvest special.

Thus a department can earn a reputation for offering the unusual special and yet it will stress the best buys.

Tables 46, 47, and 48 show that melons are good feature items from mid-June to early September. Watermelons are at their peak in Michigan from mid-June to mid-July. Although they are not a frequently bought item, during their peak they do account for a large tonnage and are especially timely for Independence Day promotions. On the other hand cantaloupes seem to hit two peaks. During the period covered in Table 46 cantaloupes were purchased by about 41 percent of the families each week and during the same four week period 71 cantaloupes were purchased per 100 persons. These early cantaloupes are from California. As the season continues California declines in importance while the first of Michigan's crop begins; this accounts for the slight decline in consumption as reported in Table 47. The second peak hits during August when consumption climbed to 98 cantaloupes per 100 persons. Thus cantaloupes offer good promotion possibilities as "first of the season specials" and "home-grown features."

The fourth group of feature items involve the numerous soft fruits which the consumer anticipates as the summer months arrive. All of the soft fruits are highly perishable so they must be moved fast.

Cherries start off the soft fruit season in Michigan. They start about the first of July and continue for about one month. As a promotion item they could be featured strongly for one week and then cut back. According to Table 47, sweet cherries accounted for

about 22 pounds per 100 persons in that four week period with only 6 percent of the families buying. Sour cherries accounted for 31 pounds per 100 persons and only 3 percent of the families buying each week. In spite of the small number buying, the high consumption and high margins make both of these good in-the-store promotions. A split table display might be incorporated which would show sweet cherries for eating on one side and sour cherries for canning and baking on the other.

Following the cherries is the peach deal parade. West Coast and South Atlantic states start the parade during July, with Michigan hitting the peak from mid-August to mid-September. Table 48, which covers the period from August 9, 1953 to September 5, 1953, places peaches as the number one fruit and vegetable in both dollar expenditure and frequency of purchase. During this period 535 pounds were purchased per 100 capita, 14.4 percent of the fresh fruit and vegetable dollar was spend on peaches and 42 percent of the families bought them during the week. As favorable as these results are, many retailers fail to take advantage of this promotion opportunity. Competition from producer sources and high spoilage are the most frequently cited reasons for this apathetic attitude. Aggressive promotion of bushel sizes for canning will contribute to overall produce sales volume; while featuring the pound size for eating will take advantage of the traffic building nature of this item.

The last of the major soft fruit items is grapes. Although the peak season for grapes does not come until early fall, the Thompson Seedless grape is in prominence during August. Table 48 shows that

about 20 pounds were consumed per person during this period while about 9 percent of the families made weekly purchases.

There is one vegetable item that comes into the produce department for major attention during the summer. Table 47 shows that sweet corn started to come into the market in large quantities during the middle of July. Corn ranked sixth in expenditure with 362 ears purchased per 100 capita during the four weeks and 28 percent of the families bought corn every week. Table 48 indicates that corn dropped to seventh in expenditure rank but the quantity purchased per capita increased to 447 ears per 100 capita and the frequency of purchase remaining almost identical to Table 47. During this latter period the home-grown season is on in Michigan and as indicated in Table 48 larger quantities are purchased per shopping trip.

The promotion of seasonal items such as found during the summer in Michigan offers the operator a real opportunity to add interesting variety to the produce department. Panel data helps to point out to the retailer the items that are most important in terms of volume and frequency of purchase. These two factors of volume and frequency of purchase are two important criteria in selecting product items that will have maximum promotion appeal. Panel data provide a guide in selecting items by use of these two criteria. Once the item has been selected advance planning as to type of display, location of display, and related item tie-in are possible.

The first three limitations to using this data for advertising and promotion apply as they did for purchasing. First, fluctuations in the day-to-day market situation provide a limiting factor in

suggesting a definite date for a particular item promotion. However, promotions should be planned far enough in advance so that proper ordering can take place, displays planned and built, and personnel informed. When such advance planning takes place, panel data becomes more effective.

The limitation of applicability to any one store is less of a problem in advertising and promotion than in buying. The items as shown in the panel data are the items that customers are most interested in. Information that shows the relative interest in the items, such as panel data does, is all that is needed to provide a guide as to promotion potential. The ordering or buying of specific quantities for any one store takes a more exacting type information that panel data can provide.

The third limitation of lack of knowledge as to variety, size, quality, etc. is less of a limitation to use than are the former two. All that panel data should do is provide a guide as to the relative opportunity each item provides as a promotion possibility. Although further information about a product would be helpful it should not be a detriment to panel data use. For example, in Table 48, tomatoes appear to be a much better promotion item than apples; however, during the period covered in Table 49 the opposite situation prevails; apples are a better promotion feature than tomatoes. Again this limitation will only apply on items that are merchandised in wide ranges of sizes and varieties.

Display

How to make the best use of space is a major problem in the food retail store. To a self-service operator this is particularly important. His store is set up on the theory that goods are sold by displaying them. The aim in allocating space within the selling area is to maximize the productivity of the entire display area by causing each square foot to make its proper contribution.

As desirable as this information is in allocating store space to the produce department, panel data would be of no help in supplying figures on which to make an appraisal. Several measures of productivity of space could be considered in making allocations. Among those that can be expressed on a square-foot basis are net profit, gross profit, sales in terms of dollars, and sales in terms of quantity sold. Net profit represents the most desired measure. When gross profit instead of net profit is used as a measure of space productivity, some adjustments are necessary to allow for those commodities for which operating costs are relatively higher. Dollar sales per square foot of floor space is one step farther removed from net profits than is gross profit. This is because dollar sales must be adjusted for variation in both commodity margins and operating costs. Data on quantity sold takes no account of return to the store. Since panel data does not provide information on any of these four measures of performance its usefulness as a guide to produce department space allocation is negligible.

In the management of space within the produce department panel data is again of little usefulness. For panel data to be effective,

fresh fruits and vegetables would have to be sold in proportion to the amount of space devoted to it. For example, using Table 48, peaches would receive 14 percent of the space because it accounts for 14 percent of the total fresh fruit and vegetable expenditure. Likewise blueberries and watermelons 3 percent of the space, cantaloupe 10 percent and squash less than 1 percent. The primary fault of displaying in proportion to dollar sales value becomes obvious from considering the before-mentioned items. Namely, bulky items such as squash, watermelons, peaches, and cantaloupes require a certain minimum space regardless of their sales potential. Less than 1 percent of the space would hardly be adequate for squash; while blueberries will probably require less space than watermelons although they both account for 3 percent of the sales dollar.

In a study by H. Wayne Bitting on produce department space utilization some interesting observations were made on the management of space.[3] It was found that potatoes and onions have low rates of sale per square foot. In contrast to those two items, dollar sales per square foot of floor space for tomatoes and lettuce are larger than the percentage of total floor space they occupy. However, there are several factors that must be considered before it can be concluded that space should be shifted from potatoes and onions to tomatoes and lettuce. First, high-value non-bulky items may require less space

---

[3] H. Wayne Bitting, "Produce Department Space Utilization, Gross Margins and Operating Costs in Selecting Retail Stores, Charlotte, N. C." United States Department of Agriculture, Market Research Report No. 36, Washington, D. C., 1953.

then bulky low-value items. Second, increased sales may not result in proportion to the increased display space. Third, it might be advantageous from the standpoint of efficient use of labor and maintaining adequate selectivity for customers, to allocate space beyond that indicated on the basis of dollar sales per square foot of floor space. Fourth, the margin of gross profit is an influencing factor in allocating space.

The second factor of sales not increasing in proportion to additional space given them is further elaborated upon in a study by Walter B. Hinkle, Jr., entitled "Merchandising Fresh Fruits and Vegetables in Retail Stores."[4] In the stores studied, large displays usually sold more of individual fruits or vegetables than stores having small displays, but the difference in sales were usually far from proportionate to the increase in size of display areas. For example, it took a 223 percent increase in average size of cauliflower display to bring about a 118 percent increase in sales per store. It required a 296 percent difference in display to bring about a 66 percent increase in the sale of tomatoes. Greater results were usually obtained by increasing size of display on Friday and Saturday than during the fore part of the week. Since total floor display in a produce department is limited, an increase in size of display of one commodity means that the area allotted to some other commodity must be correspondingly reduced.

---

[4]Walter B. Hinkle, Jr. "Practices Affecting Sales and Spoilage." Merchandising Fresh Fruits and Vegetables in Retail Stores, Part II. Cornell University Agricultural Experiment Station, A.E. 819, 1952.

The allocation of space to produce items is probably tied up with the way the retailer buys, rather than the sales requirements. Non-perishables are bought in fairly large quantities. They are then allowed to take up a large part of the display space to minimize movement into and out of storage space. More frequent deliveries of the perishables are required and the custom has been to pile up limited stock on hand as with the less perishable products.

Although panel data is of limited usefulness as far as indicating the correct amount of space that is necessary to maximize sales and net profits, it can be of use in a general way. One of the principles of produce rack display is to space the large sellers so that lower volume "impulse" items can be intermingled among the more frequently bought items. Panel data indicates which items are selling best and what there frequency of purchase is. As the seasons change certain produce items should be given more space, some less space, and some eliminated. Panel data indicates this in a general way. For example, by comparing Table 47 with Table 48, indicates that the amount of space peaches were given in August should be greater than July, and apple space should likewise be greater in August than in July. An examination of other items in these tables and other items between tables will reveal the need for changing the relative size of display of each commodity between seasons.

These findings indicate the need for keeping records on individual items so that the return per square foot of floor space is known. Such information will enable the store operator

to allocate space more efficiently. For the reasons elaborated above, panel data does not provide this information.

Pricing

The problem of pricing merchandise is one that is a vital problem to all merchants whether they are large or small. Prices so low that they do not cover costs or expenses, or so high that they lessen sales volume will have an adverse effect on profits; and if not corrected by use of more realistic prices, will soon put a store out of business. Also, since many women give high prices as a reason for trading at more than one store, the grocer who is interested in increasing his store volume, holding his regular customers, and making his store a one-stop food center must be competitive in price.

In general, well defined limits govern the amount of margin that a store operator can add to the purchase price of his merchandise, the lower limit being one that will yield sufficient dollars of gross profit to cover operating costs. The upper limit is the one that will give the largest net profit above his operating costs that his competition will permit. However, most retailers follow a middle-of-the-road practice in establishing an overall produce department gross margin. This enables the retailer to be competitive and yet expand future volume. Likewise, prices are not set so that operating expenses are merely covered, unless a larger share of food retail business is being temporarily sought for what may be a more profitable field later.

The point of departure for fresh fruit and vegetable pricing is the price necessary to cover, merchandise cost, merchandise losses, operating expense, and leave the residual net profit. This would give the operator a certain overall gross profit percentage figure from which to base calculations. For example, if an operator has the following costs; operating expenses 17 percent, merchandise loss 5 percent, and net profit (desired) 3 percent, the overall pricing objective would be 25 percent. However, this does not mean that an operator would necessarily markup each produce item 25 percent. Most progressive food retailers use flexible margins between items and on the same items over time.

In the study by H. Wayne Bitting, the author points out that individual stores followed no consistent pricing policy.[5] Margins on single items within a particular store fluctuated over a three week period and margins on single items between stores at a particular time period fluctuated widely. This seems to point out that individual retailers do not follow an inflexible markup for all produce items but rather vary the markup according to other criteria. And second, this study points out overall pricing objectives in terms of gross profit vary between stores.

These "other criteria" that are used in pricing fruit make it difficult to subject pricing practices to any scientific formula. The criteria or factors that cause price variance between stores are as follows:

---

[5] Bitting, op. cit., p. 12.

1. Different pricing objectives (includes operating costs, merchandising losses and net profits).
2. Different costs of merchandise (based on differences in quantity and quality bought).
3. Competition.

The criteria and factors that causes margin differences between items within a store and within items over a time period are as follows:

1. Advertised "loss leader" features (low margins are taken on these items in the hope that high volume sales of the particular items will compensate for the low margin and/or items carrying a high margin will be purchased; and second, a low price impression for the store will result).
2. Different costs of merchandise (based on difference in quantity and quality purchased and difference due to supply and demand factors).
3. Volume of sales (items bought in larger amounts and more frequently usually carry smaller gross margins).
4. Operating costs (items requiring more handling usually carry larger margins).
5. Spoilage (items in which spoilage, markdowns, and other losses run high usually require higher margins).

The objective of the sales plan is to arrive at specific margins for groups of produce items while maintaining a sales balance between high and low margin items in relation to their sales volume. The margins are combined so as to arrive at an overall department margin

that is adequate to cover expenses and leave a net profit. The plan also permits a flexible pricing system, so that feature items may be promoted without sacrificing profits. Thus, the plan permits margins to be taken on individual items, so that consideration is allowed for competition, volume potential, operating costs, losses, and promotional features.

A study of past sales records enables the merchant to estimate quite accurately his produce requirements for a given time period. Then, by placing realistic flexible margins on groups of produce items of a known cost, future dollar sales can be estimated. By totaling the estimated sales for each group of produce items a department sales potential will result. Items are gathered into the following groups for convenience purpose; citrus, bananas, other fruit, vegetables, potatoes, and feature items. The margins assigned are arbitrary but yet they take into account the criteria of volume sales, operating costs, and spoilage.

A most accurate plan results when costs are known, but barring the knowledge of known cost a sales plan can be derived in advance by using panel data. In place of a known cost the percentage of total fresh fruit and vegetable expenditure can be used. By using the data in Table 48 and assuming that during one of the weeks of the months the retailer would like an approximate 24 percent gross margin, a sales plan as follows could result.

Product Group	Produce Sales Distribution	Gross Profit Desired	
Citrus	6%	25% (25% x 6%) =	1.5
Bananas	7	20% (20% x 7%) =	1.4
Other fruit	18	30% (30% x 18%) =	5.4
Vegetables	28	35% (35% x 28%) =	9.8
Potatoes	10	20% (20% x 10%) =	2.0
Main feature[1]	14	5% (5% x 14%) =	.7
Secondary feature[2]	17	15% (15% x 17%) =	2.6
	100%	Gross Margin	24.4%

[1]Main feature items - peaches.

[2]Secondary feature items - cantaloupe and tomatoes.

This sample sales plan shows that planned gross margin of 24.4 percent can be realized if all of the merchandise is sold and the selected margins realized. It must be recognized, however, that these are planned sales and in retail practice only a portion of it is realized because of spoilage, shrinkage, markdowns, pilferage, cash register error, etc. After a study of department records over a period of time, a figure representative of these unrealized sales can be made. Depending upon the store, season, equipment, etc., this figure ranges from about 2 percent to 6 percent. Thus, subtracting a shrinkage figure from the planned margin, an adjusted margin figure is arrived at. Example, 24.4 percent - 4 percent = 20.4 percent.

The merchant must now decide whether this margin is too low, too high, or about right. His past experience and sales record are the best guide for determining this. To raise the margin, the margin on any or all groups should be raised. To lower, the process should be reversed. All produce in any one group does not necessarily

have to be priced at the same profit margin. Instead, the merchant may use average margins of profits methods. For example, the "must move" type of produce are priced "on the easy side" margin of profit in order to speed sales and turnover.

Thus, panel data are quite useful as a guide to produce price planning. However, where known merchandise costs and relative merchandise movements are known for a particular store, the usefulness of panel data is diminished. But, it should be emphasized that pricing tables should only be used as a guide and should not supplant the individuality and experience of a food retailer. Because of the uniqueness of a particular operator and his store the art of merchandising will never be reduced to a scientifically precise formula.

Summary

In the four commodity chapters, individual items were studied intensively over an extended time period. Little thought was given to the relationships that exists between products for a short time interval. In this chapter the emphasis is changed away from intensive study of one item to a study of the usefulness of Michigan State University Consumer Panel data as an aid in performing certain specified functions of retailing. The approach taken was to examine the relationships between items during a four-week period to see how this information was applicable to the functions of purchasing, advertising and promotion, displaying, and pricing.

As an aid to purchasing, panel data was a useful guide for advance planning because it indicated a basic stock list based upon the most important dollar-wise items. However, as a day-to-day

purchasing tool the usefulness was limited because of fluctuations in daily supply and demand, the difference in product demand between stores, and the range in quality and variety characteristics within a single item. These same limitations apply to data used in advertising and promotion, but again the panel data is a good guide in selecting advertising features based upon the criteria of item sales volume and frequency of purchase.

Panel data was not too useful as a guide to allocating item display space within a produce department because of the necessity of devoting more space to bulky items to receive a minimum of space than there relative sales value would indicate. In pricing, panel data is an excellent guide in sales planning. By knowing the relative movement of items certain flexible margins can be assigned to these items so as to arrive at an overall satisfactory gross margin. However, pricing tables will never supplant the individuality and experience of a food retailer.

CHAPTER VIII

SUMMARY

In 1951 the Michigan State University Consumer Panel was established as a means for receiving information on the food purchase behavior of Lansing, Michigan families. Diaries are filled out each week so as to contain the food items purchased, quantity bought, price paid per unit, expenditure, and, for some products, method of purchase and type of product preservation. One of the areas of usefulness of these data is to the retail food trade. By providing information on who the customers are, what they buy, when they buy, and how much they buy, panel data helps to answer the question, "What do the customers want?"

The purpose of the study was to show the types of data that are available from the panel for use by retailers who handle fresh fruits and vegetables and second, to evaluate its potential as an aid in retailing. To accomplish these purposes an intensive study of four commodities was presented. In order to develop the subject most completely studies that pertain to the commodity were discussed along with pertinent panel data. Secondly, panel data were presented by relating it to certain functions of retailing through the use of all the major fresh fruits and vegetables in the short time interval.

The first commodity studied was potatoes, which are the top item in tonnage movement and usually highest in consumer expenditure dollars. The Michigan potato is the most popular of all potatoes

and should be carried by retailers in Michigan during most of the year. During the fall prepack sizes should be 15 pounds, and 50 pounds. In the winter the 10 pound size should be added to this list. In the spring the sizes most in demand were the 10 and 15 pound units. When the early crop comes to market during the late summer the large size unit of either 50 pounds or 100 pounds should be added to the 10 and 15 pound bags.

The California potato comes onto market in the spring at about the same time that Michigan stocks are depleted and are off the market by the time Michigan's crop starts in the late summer. The 10 pound size unit seems to be the only justifiable size. The same size package should also be employed with Idaho potatoes, which are in competition with Michigan potatoes. Maine potatoes should only be carried in the winter season in the Lansing area. In spite of their promotion in Lansing, the Maine potato accounts for only 5 percent of the potato expenditure during their peak winter season.

In spite of the predominance of prepackaged potatoes, the bulk sale of potatoes still accounts for about 25 percent of all sales. It would be a good practice to offer a small display of loose potatoes from either a display bin or table. For those who do not choose to use small open displays, several prepackaged bags should be opened for selection purposes. This will not only serve those customers desiring bulk potatoes but will build confidence in prepackaged displays.

In studies to determine the acceptability of various packaging containers the results clearly indicate the demand by customers for

product visibility in their selection of potatoes. The desire was strong enough that they were willing to pay a four cents premium for a polyethylene package over and above the mesh paper window bag which gives only partial visibility. In conjunction with this study it was ascertained that customers were willing to pay a two cents premium for washed potatoes over and above the added cost of washing.

From the data on family characteristics, several conclusions can be drawn. First, there appears to be a need for customer education on the low cost-high food value that can be derived from potatoes. Second, two price lines of potatoes should be carried; one a quality potato at a higher price and second, a low price competitive potato. Third, the infrequent purchase of potatoes by small families, points out the need to make loose bulk potatoes available to those families that purchase only a small total amount of potatoes.

The second commodity studied was apples, which ranked third in annual fresh produce expenditure. October was the most important month for sales of this seasonal commodity. Since over 50 percent of all sales were in units of 10 pounds or over and since many retailers fail to carry large units of purchase for an extended time period it suggests that many opportunities for increased apple sales are being missed. To solve this problem the bushel and half-bushel size could be successfully sold during certain select periods of the year.

In the smaller sizes the package weights should be varied so as to take advantage of the seasonal nature of apples. A retailer should not package one weight alone, such as 4 pounds, but should vary the

weights between 2 to 6 pounds with the majority of the bags packed at the most popular seasonal size. Panel data and merchandising studies have shown that bulk displays alone and prepackaged displays alone are relatively ineffective when compared with combinations of bulk and prepackaged apples. The objective is to appeal to the desires of the maximum number of customers without sacrificing labor efficiency.

Data on the relationship between family characteristics and fresh apple purchases points to the need of having (1) the period when apples are available for sale extended, and (2) education that would encourage children to eat more apples.

Although the fresh orange is still a large volume item, its sales in the past few years have fallen at the profit of the frozen orange juice concentrates. In comparing fresh orange purchases from year to year it appears that increases in expenditure are related to promotion and merchandising effort as well as price.

A review of the studies on pricing methods revealed that customers preferred selecting their oranges when priced by count rather than by weight. In view of this preference it would still behoove the retailer to avoid a complete change over to pricing by weight.

The prepackaged orange is far from being universally accepted. In the winter of 1955 about 40 percent of the purchases and 45 percent of the quantity was sold in prepackaged form. The only sizes that seem logical to package are the one and two dozen units.

Families that buy the largest quantities of oranges are families that have larger family incomes and larger numbers of persons. There was a direct relationship between per capita income and per capita

quantity. Although larger families buy more oranges per family, they buy smaller amounts on a per capita basis, which would suggest that orange consumption is low among children.

The last commodity studied was grapefruit. This item is on the market in Lansing in all but the summer months. From the data it appears that consumption per capita increases as the percentage of families buying increases. More than 16 percent of the Lansing families bought no grapefruit at all in 1953.

As with oranges most customers still prefer to buy their grapefruit priced by count rather than by weight. The change in prepackaging from almost complete absence in 1949 to about 45 percent of quantity being sold in prepackaging form in 1955 indicates that many of the former objections to this form of merchandising have been eliminated. Since there appears to be no definite size of package that outsells any other size a retailer should change the quantity to fit a particular merchandising situation.

Although many customers have made the decision to buy a particular type of citrus product before entering the food store, that decision to buy was often changed after an inspection of the merchandise. The retailer can help to stimulate the desire to purchase by selecting fruit of good quality and full maturity and then follow the desirable handling and merchandising practices. Since most of the grapefruit are purchased by families that are of small size and large per capita income, advertisements to increase consumption should point out the low cost per serving for the health value derived.

In the four commodity chapters emphasis was placed on the individual item while in Chapter VII the emphasis was changed to a study of all fruit and vegetables in the short time interval. Relating this information to specific retailing functions revealed the following conclusions:

1. As a guide to purchasing, panel data were useful as a tool in planning a basic stock list, but as a tool in day-to-day ordering the usefulness was limited because of fluctuations in daily supply and demand, differences in demand between stores, and differences in the range of quality and variety.

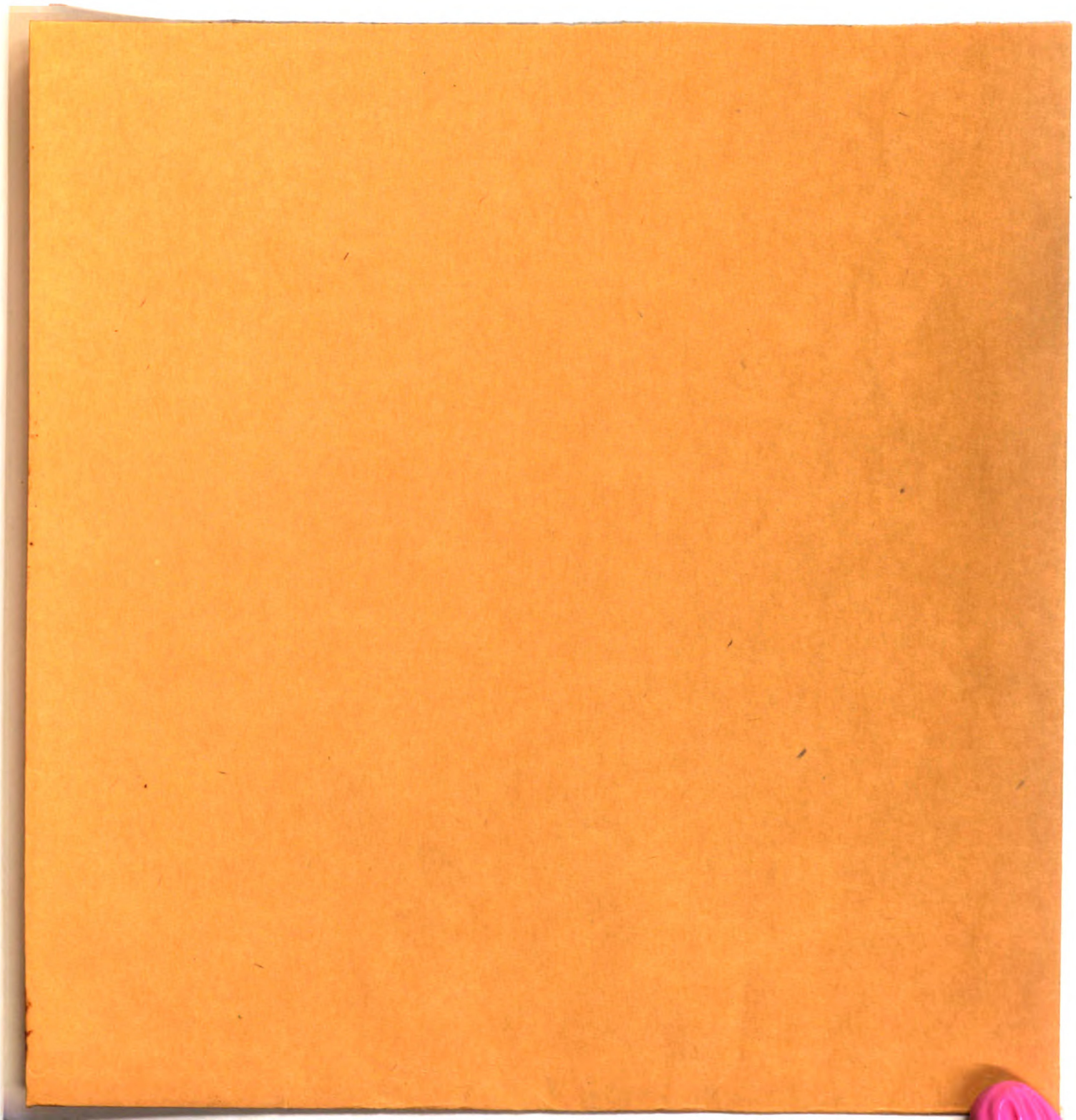
2. The same limitation applied in advertising and promotion, but the data are useful in selecting promotion items based on the criteria of sales volume and frequency of purchase.

3. Because of the variety of factors other than sales volume and sales distribution that affect display allocation, panel data are of little help in reaching merchandising decisions.

4. Pricing sales plans can be derived based upon panel data; however, their usefulness decreases in relation to difference between sales distribution as reflected at store level and as reflected in panel data.

Panel data serve as an excellent guide in helping the individual reach merchandising decisions but its use should be tempered with the experience and ability of each individual retail operator.

APPENDIX



BIBLIOGRAPHY

Books

Clements, F. and T. Mayers. "How They Tell What We Want." Yearbook of Agriculture. United States Department of Agriculture, Washington, D. C., 1954, pp. 207-211.

Paffenberger, A. T. Psychology in Advertising. Chicago: A. W. Shaw Company, 1926, p. 4.

The Progressive Grocer. How to Make Money Selling Fresh Fruits and Vegetables. New York: The Butterick Company, Incorporated, 1949, 314 pp.

Walsh, R. M. "And What Are Its Parts?" Yearbook of Agriculture. United States Department of Agriculture, Washington, D. C., 1954, pp. 8-11.

Periodicals

Anon. "Produce Manual." Chain Store Age. March, 1955, pp. 91-126.

Applebaum, W. "Studying Consumer Behavior in Retail Stores." Journal of Marketing. October, 1951, p. 172.

Bolstad, N. H. "Freshness Keys Summer Produce." Chain Store Age. July, 1955, pp. 63-82.

McGoha, M. "Stock More and Sell More." The Grocers Digest. July, 1952.

Shaffer, J. D. and G. G. Quackenbush. "Cooperation and Sampling in Four Years of M.S.U. Consumer Panel Operation." Quarterly Bulletin. Agricultural Experiment Station, Michigan State University. August, 1955, pp. 85-103.

Shaffer, J. D. "A Plan For Sampling a Changing Population Over Time." Journal of Farm Economics, Volume 37, 1954, pp. 153-163.

Sherman, R. W. and G. H. Mitchel. "Sell Prepackaged Apples in a Variety of Sizes." Progressive Grocer. January, 1954, p. 92.

Bulletins

Anon. "Citrus Preferences Among Household Consumers in Louisville and Nelson County, Kentucky." United States Department of Agriculture, Washington, D. C., Information Bulletin No. 2, January, 1950.

Anon. "Consumer's Use of and Opinions About Citrus Products." United States Department of Agriculture, Washington, D. C., Agricultural Information Bulletin No. 50, 1951, pp. 1-16.

Anon. "Effective Display." Produce Handbook. Part II. Proceedings of the SMI Regional Managers Meeting. Supermarket Institute.

Anon. "Merchandising Studies in Supermarkets--Apples, Lettuce, and Tomatoes." United States Department of Agriculture, Washington, D. C., AMS-18, 1955, 9 pp.

Anon. "Ordering and Inventory Control." Produce Handbook. Part I. Proceedings of the SMI Regional Managers Meeting. Supermarket Institute. pp. 6-9.

Anon. "Potato Preferences Among Household Consumers." United States Department of Agriculture, Washington, D. C. Miscellaneous Publication No. 622, 1948.

Bemis, K. P. and R. A. Seelig. "Fruit and Vegetable Facts and Pointers." United Fresh Fruit and Vegetable Association. Washington, D. C., 1952.

Bitting, H. W. "Produce Department Space Utilization, Gross Margins, and Operating Costs in Selected Retail Stores, Charlotte, N. C." United States Department of Agriculture, Washington, D. C. Market Research Report No. 36, 1953.

Davis, L. H. "Applying Improved Apple Merchandising Practices in Retail Stores." Cornell University, Department of Agricultural Economics, Ithaca, N. Y., Bulletin 870, 1951, 35 pp.

Downie, E. D. and K. R. Trienish. "Consumer Buying Practices and Preferences for Purchasing Oranges by Weight or Count in Selected Cities." United States Department of Agriculture, Washington, D. C., June, 1950.

Fugeth, K. A., J. A. Bayton, and H. W. Bitting. "Citrus Preferences Among Customers of Selected Stores." Texas Agriculture and Mechanical College, Bulletin 722, 1950.

Godwin, M. R. "Consumer Acceptance and Retailing Losses. Consumer Packaging as a Method of Retailing Fruits and Vegetables in the Northeast." Part I. Cornell University Agricultural Experiment Station, Ithaca, New York, Bulletin 870, 1951, 35 pp.

Hinkel, W. B. "Practices Affecting Sales and Spoilage. Merchandising Fresh Fruits and Vegetables in Retail Stores." Part II. Cornell University Agricultural Experiment Station, Ithaca, New York, A.E. 819, 1952, 62 pp.

Kohls, R. L. and R. Mawby. "Retail Produce Departments." Agricultural Extension Service and Agricultural Experiment Station. Purdue University, Station Circular 382, 1952, 11 pp.

Perry, A. "Plastic Bags for Potato Packages." University of Maine. Bulletin 514, May, 1953.

Pillar, R. "A Guide To Better Handling and More Efficient Merchandising of Fresh Fruits and Vegetables." National League of Wholesale Fresh Fruit and Vegetable Distributors. Washington, D. C., March, 1948.

Rasmussen, M. P. "Consumer Purchases of Fresh Fruits at Retail." Cornell University Agricultural Experiment Station, Ithaca, N. Y. Bulletin 849, 1948.

_____. "Consumer Purchases of Fresh Fruits at Retail." Cornell University Agricultural Experiment Station, Ithaca, New York. Bulletin 851, 1949.

Shaffer, J. D. and G. G. Quackenbush. "Consumer Purchase of Apples." Agricultural Experiment Station, Michigan State University. Special Bulletin 405, 1955, 27 pp.

Ulrey, O. "Public Produce Markets in Michigan." Agricultural Experiment Station, Michigan State College. Special Bulletin No. 268, 1937, p. 13.

Unpublished Material

Bucell, B. R. "Produce Merchandising in a Retail Cooperative." Unpublished M.A. Thesis. Graduate School of Michigan State College, 1954, 99 pp.

Javitch, L., J. Silverburg, and L. Steinberg. "A Comprehensive Study of Food Chain Newspaper Advertising." Unpublished Seminar. Michigan State University, 1954, 68 pp.

Riley, H. M. "Some Measurements of Consumer Demand for Meats." Unpublished Ph.D. Thesis. Graduate School of Michigan State College, 1954, 174 pp.

Shaffer, J. D. "Methodlogical Bases for the Operation of a Consumer Purchase Panel." Unpublished Ph.D. Thesis. Graduate School of Michigan State College, 1952, 751 pp.

Speeches

Malmicoff, D. G. "Economic Trends in Produce Consumption." A speech presented at the National Association of Food Chains Clinic on March 15, 1954.

Quackenbush, G. G. "Demand Analysis From the M.S.U. Consumer Panel. A paper delivered at a joint meeting of the American Statistical Association and the American Farm Economics Association. Washington, D. C., December 30, 1953.

Miscellaneous

Anon. "Census of Business, Retail Trade." Preliminary Data. Bureau of Census, Washington, D. C., 1954.

Anon. "Census of Population. Characteristics of the Population." Volume II. Bureau of Census, Washington, D. C., 1950.