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## RESEARCH UPDATES

Chairperson: Dr. Jarvis L. Cain

### Organization of Scanner Data for More Effective Usage in Managerial Decision-Making

by

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This study addressed the lag in effective usage of scanner-derived information in managerial decision-making. The purpose of this research was to clarify the informational needs of the various levels of management in a retail grocery firm and to develop an informational management system to deliver such information. The four specific objectives of this project were: (1) to identify the decision-making roles of the various levels of management in a firm, (2) to identify the present usage of scanner-derived information in decision-making, (3) to identify specific scanner-derived information which could facilitate the decision-making process, and (4) to develop a firm-wide information management system which would provide each management level with the information it needs and would coordinate total firm operations, but would not burden a particular level with large volumes of unnecessary data.

The information used for meeting the objectives of this research was largely col-

lected through open-ended discussions with various levels of management within seventeen cooperating retail grocery firms. The discussions placed emphasis on the current usages of scanner data and on how to facilitate the use of scanner data in managerial decision-making.

The research substantiated the hypothesis that little use had been made of scanner data for managerial decision-making in retail grocery firms. Also, barriers to the effective use of scanner data were documented. The specific informational needs of the various levels of management, as discovered through the discussions with managers of the cooperating firms, were used as the basis for the information management system.

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# Effects of Entry and Changes in Demand on Concentration In Wholesale Grocery Markets

by

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## Statement of the Problem

Sales concentration continues to rise both nationally and in local wholesale grocery markets. The strength and pervasiveness of the growth in concentration creates public concern because high concentration levels are sometimes forerunners of the exertion of market power by large firms. Significantly, wholesale firms are also growing, primarily through mergers and acquisitions.

Through mergers, acquisitions, and internal expansion, large wholesale firms have positioned themselves in most of the major markets in the nation. The growth of large firms and the rise in concentration have occurred at the same time, but possible links between these developments have not been established.

## Objectives

We investigate these questions about changes in concentration in wholesale grocery markets:

1. Do mergers tend to increase concentration?
2. Does market entry affect concentration?

3. Is concentration affected by competition between integrated chains and independent wholesale distributors?
4. Does prior market position influence concentration?
5. Does concentration rise or fall in expanding markets?

## Methodology

We determined the net effects of market forces on concentration with a multiple regression equation estimated by ordinary least squares. Following industrial organization theory, we assumed that changes in local market concentration depend on entry conditions and prior levels of concentration. We also included an additional structural variable to account for possible changes in concentration induced by shifts in local distribution channels. Finally, we included market growth.

## Conclusions

Entry by wholesale grocery industry leaders reduced local concentration where they expanded internally to new distribution areas. This suggests that leading firms' expansion heightened competition. Entry by acquisition was not significant but its negative sign also implies heightened competition with the ap-

pearance of leading wholesale firms. Concentration fell significantly in expanding markets, implying that growth engendered better market opportunities for distributors and, by extension, that local retailers probably had a larger base of suppliers.

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## **U.S. Fruit and Vegetable Processing Industries: A Structural Perspective**

by

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### **Problem Addressed**

Like most food manufacturing subsectors, the fruit and vegetable processing subsector is in a dynamic era of change. Historically, structural transformations of the fruit and vegetable processing subsector have been preceded by changes in technology, market conditions, and regulations. However, these changes may not be homogeneous across subsectors or even within subsector industries. Therefore, studies which take an aggregate approach to evaluating structure and performance of the food manufacturing sector may overlook important subsector-specific changes. Despite the overall importance of fruit and vegetables in consumption and their increasing use in value-added products (e.g., frozen prepared dinners), few research projects since the extensive study conducted by the National Commission on Food Marketing in 1966 have evaluated structure and performance in the fruit and vegetable processing subsector. Consequently, there is a lack of knowledge on how, for example, current supply trends, import competition, demographics, technology, and gov-

ernment policy and regulation are transforming structure and performance of the subsector. This study will increase knowledge by providing: (1) a description of the current structure of the fruit and vegetable processing subsector, focusing on number, location, size, concentration, etc., of firms; (2) identification of supply and demand conditions, regulations, trade policies affecting the subsector; and, (3) an assessment of the effects of these factors on current structure and performance of the subsector and the future direction of change.

### **Methodology**

The project will be organized using the basic structure-conduct-performance paradigm of industrial organization theory. This approach generally specifies that market performance is influenced by market conduct, which in turn is determined by market structure. In addition, the analytical framework will be broadened to include the effects of foreign trade and government policy and regulation. Data sources will include various fruit

and vegetable statistics published by the Economic Research Service and the U.S. Department of Agriculture. The 1982 Census of Manufactures will also serve as a primary data source, and trade publications and industry sources will be used whenever possible.

### **Major Findings and Their Significance To Food Distribution**

The project will provide an in-depth analysis of the fruit and vegetable processing subsector not undertaken since 1966. Since dynamic changes in economic and political factors lead to structural changes, more current information is needed to identify the causal relationships leading to structural evaluation and the economic and social implications for the future. Preliminary statistics and findings should be available in January 1987.

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## **Price Formation Over Space in the U.S. Sweetener Market**

by

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### **Problem**

Although sweeteners are important in the diet of consumers and in the food processing industry, recent studies on interregional trade of sweeteners in the United States are practically non-existent. This project is an attempt to fill this void. The objectives of the study are: 1) to determine the optimal flows of sugar and high fructose corn syrup (HFCS), and 2) to evaluate the wholesale pricing system for these sweeteners. The findings are intended to contribute toward overall marketing efficiency.

### **Methodology**

The objectives will be achieved by applying interregional trade theory, linear programming and statistical analysis. Objective 1

involves construction of a transportation model intended to minimize the total transfer cost for the distribution of sugar and HFCS, subject to demand and supply constraints.

Objective 2 requires utilizing the results of the LP-model to derive theoretical prices with the New York domestic price, for example, serving as the base price. These derived prices will be compared to the actual prices at the production sites and consumer markets. Subsequently, statistical correlation analysis will be performed and an assessment of market imperfections will be made.

### **Major Findings and Significance**

Findings are currently available only for the first part of the study--i.e., optimal allocation of sugar and HFCS. Findings on

evaluation of pricing systems will be forthcoming in the near future.

The results on optimal flows indicate how sugar and HFCS should have flowed, so that the total cost of distribution would be minimized. The results indicate reasonably normal flow patterns and have implications for several participants in the sweetener industry (industrial users, refiners and processors, cane and beet growers, consumers, transportation companies, policy-makers and researchers). These participants could use the results for different purposes--i.e., evaluation of procurement practices, indication of locations for stocks, likely future flows, etc.

Findings on the second phase of the study will indicate the degree of pricing inefficiency in the system.

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## Preferred Points of Origin for Selected Foods

by

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The objective of this study was to evaluate the impact of point-of-origin identification in generic advertising. Specifically, the study sought to determine the importance of point-of-origin identification to the consumer, consumers' present levels of awareness of product sources, and the specific impact of "Florida" identification for an array of nine fresh fruits and vegetables and Florida-produced wine.

A telephone survey of 300 primary food shoppers was conducted in early 1986. Equal numbers of shoppers were interviewed in Orlando, Florida; Chicago, Illinois; and Phila-

delphia, Pennsylvania. A systematic random sample, along with alternates, was drawn from the respective metro-area telephone directories. The "plus-one" technique was also used to enhance the randomization process. Interviews were conducted in trained, professional interviewers.

Consumers attached much importance to knowing the point of origin for some products, but little importance to others. For example, beef, wine and sweet corn were among the items for which consumers indicated a strong desire to know the point of origin, but they

expressed less interest in the origins of celery and blueberries.

Consumers were also found to have little knowledge of where many fruits and vegetables originated. For example, 63 percent were unable to name a single source of winter and early spring tomatoes, and 62 percent were unable to give a source of sweet corn. Over half were unable to give a geographic source for strawberries and blueberries. These findings also indicate that many consumers do not place much importance on knowing the point of origin.

When given a choice of specific food items from various points of origin, considerable variation was found among cities. For example, consumers in Orlando expressed a strong preference for Florida-grown tomatoes, but Chicago respondents preferred California tomatoes.

The study also indicates that point of origin identification for some items could be determined for some products. For example, when given a choice of wine produced in California, New York or Florida, only one percent of all respondents chose Florida wine. Similarly, only 10 percent chose beef produced in Florida. Obviously, attempts to assert Florida as a preferred source would be difficult and costly.

In summary, the importance of origin varies by product and by location of respondents. Many consumers appear to be apathetic, but there are sizable market segments that have strong preferences as to origin for some commodities. Further, some geographic areas may have an inherent disadvantage in generating favorable images for certain products. Thus, the impact of point of origin identification on consumers should be carefully explored prior to launching generic promotions.

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## Retail Produce Managers Evaluate Sweet Potato Shipping Containers

by

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### Summary

Research studies by the Association of American Railroads and Michigan State University have found packaging failure and improper handling to be among the leading causes of marketing losses for potatoes in the United States. As part of an overall project investigating methods of improving sweet potato arrival quality, this project focused on an examination of five alternative shipping container designs. The purposes of the study

were to assess and compare the extent and level of scorable damage incurred to sweet potatoes shipped in each box design and to obtain retail produce managers' preferences for each shipping container.

Using a 6 x 6 latin square experimental design, five alternative box types in two markets over a six-week period were evaluated. Each market contained a subgroup of six stores which received weekly shipments of sweet potatoes from a common shipping facil-

ity. Every attempt was made to pack sweet potatoes that were uniform with regard to harvest date, growing conditions, variety, storage conditions, field quality, pallet position, and within truck placement. Extension horticultural specialists and box company representatives were used to evaluate sweet potato and box integrity upon arrival at store locations. The five alternative shipping containers were:

- (1) the Project MUM design (45 lbs.);
- (2) the current shipping containers (50 lbs.);
- (3) the box used by a majority of California shippers (40 lbs.);
- (4) the box used by a majority of exporters (32 lbs.);
- (5) an experimental one-piece box developed by a box manufacturing company (50 lbs.)

Results indicate that, on average, the Project MUM box reduced total scorable damage by 3.5 percent from the current design. There were no significant differences in average skinning and cut damage recorded among the other designs. Using a preference ranking system, however, retail produce managers preferred the 40-pound California box over the current box because of its configuration and total package weight, its handling characteristics, and its overall arrival appearance. The current 50-pound container ranked second-best in terms of least scorable damage and in retail managers' preferences. The lack of buyer preference for the MUM box, the uncertain value of reduced damage, and the increased direct cost associated with smaller volume containers suggest that shippers should examine strengthening the current container in order to improve arrival quality and reduce transport losses. This report is preliminary, however, and additional economic evaluation of findings are in progress.

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## Impact of Shelf Space Characteristics on Consumers' Produce Buying Decisions

by

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The produce department in supermarket stores is very important to store profitability. The *1986 Produce Marketing Association Almanac* reported that supermarkets' sales of fresh produce amounted to almost \$18 million in 1985. This represented 8.57 percent of all in-store sales. The gross margin for fresh produce was 32.4 percent, exceeded only by the 33.2 percent that spices and extracts

achieved. Even though sales amounted to only 8.57 percent of total in-store sales, produce contributed 11.5 percent to the total gross profits in supermarkets, second only to the meat department with 14.48 percent.

These facts become even more significant when you consider the importance consumers place on produce when choosing a supermarket.



*Progressive Grocer* reported in 1985 that, of the factors consumers identified as important in choosing a supermarket, a good produce department ranked ahead of all other store departments.

These facts indicate that a well run produce department is important to supermarket profitability and consumer satisfaction. The objective of this research is to identify those produce department characteristics that affect in-store sales and to quantify those effects where possible.

There are many ways to present produce to customers that may affect their decision to purchase produce in a particular store. An increase in the number of items on display gives consumers more variety to choose from in selecting produce. The type of display used, bulk or packaged, and display case characteristics influence the consumer's perception of produce quality. The location of the produce department in the store and certain post-harvest produce characteristics may also influence the consumer's perception of the produce department.

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The method we will use in analyzing the impact of these characteristics will be statistical regression analysis. Model definition will be dictated by data availability. Possible dependent variables that may be used are total in-store sales, total produce department sales, and store penetration in a standard market area. Produce department characteristics will be used to identify some of the variability in these dependent variables. The results should identify those produce department characteristics that have the greatest influence on in-store sales and market penetration.

# **Consumer Acceptance of Convenience-Oriented Meat Products: Pre-Cooked Vacuum Packaged Beef Roasts**

by

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## **Problem**

Consumer demand for meat and meat products has changed in recent years. Among the major factors which have been identified as the causes of these changes are an increased concern over the long-term impacts of red meat in the diet, an increased incidence of eating away from home, an increased demand for convenience in cooking, and changes in income distribution. In addition, the red meat industry is now in a mature stage, where product development and innovation will likely be necessary to bring about significant demand growth.

As a result of these changes, interest in new red meat products, particularly convenience-oriented products, has dramatically increased in recent years. To develop these types of products effectively, one must first evaluate consumer perceptions. Meat processors and retail managers need this type of information to make product development and merchandising decisions.

## **Methodology**

Data for palatability attributes, visual appearance, and consumer perceptions, are being collected from approximately 150 consumers. The data will be evaluated using percentage responses from the questionnaire and comparing responses across consumer age, income, frequency of beef consumption, and method of preparation. Standard statistical measures will be employed to identify and explain significant differences.

## **Major Findings**

The results of the study will be useful to meat processors and retail managers to: 1) assess consumer perceptions of the visual attributes of pre-cooked vacuum packaged beef roasts, 2) assess consumer demand for precooked vacuum packaged beef roasts, and 3) provide an initial assessment of how much consumers are willing to pay for convenience oriented items. Unlike previous studies, the research will provide insight into a new form of a currently accepted product. The results of the study should be of particular interest

to those involved in the current promotion and product development efforts of the red meats industry.

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## The Relationship Between Store Image and Shopping Behavior For Different Consumer Groups

by

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Retail image is measured across a number of dimensions. Many attitude research methods such as semantic differential, customer prototypes, Q-sort, Guttman scale, multidimensional scaling, and psycholinguistics can be used. Multiattribute approaches have increased in usage and many contend are more reliable. All of the techniques have significant deficiencies, however, unless different situational variables are considered.

Consequently, there is an increasing number of problems associated with the measurement, interpretation and managerial use of image study information. Store image in the past was considered to be a significant contributing factor to customer store loyalty and successful food retailing operations. Often there was a positive correlation, but even in the past not always a correlation between a highly positive store image, customer loyalty and store sales. The conventional image factor continues to be significant, but the hypothesis is that it is not as important today. This is due to changes in many individual and situation variables that are influencing the relationship between store image and shopping behavior.

Several traditional dimensions of image are being utilized in research today. However, consumer shopping behavior often is not consistent with these dimensions or segmentation variables that frequently are being used. The differences in image and shopping behavior for the various socio-economic and age groups is being studied as well as the influence of a number of situational factors. Following are a few of the many situational factors that are being considered.

1. Will the consumer shopper consider the same image factors for selecting a store when purchasing a large order of groceries as contrasted to purchasing a smaller order?
2. How will consumers consider the image factor when using a computer and/or telephone (electronic shopping) for food shopping?
3. How do the time factor, two income situation, leisure preferences, etc. influence the "Yuppie Group" when considering the selection of food store?
4. Are all stores perceived to be more or

less the same (image) by some consumer groups today?

5. How do the substantial percentage of consumers who purchase approximately half of their food from delis and restaurants or in the form of frozen dinners differ from consumers who buy most of their food from retail food stores?
6. How do the health oriented shoppers differ from the non-health oriented shoppers?
7. Are the differences today in consuming and preparing food having an influence on store selection?

The food preparation and food consumption differences are important situational influences. The hypothesis being examined relative to this factor is that there are significant differences in behavior when considering "feeding" or "dining" and "little/no preparation" or "high/time preparation."

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The information for the study is being gathered from 200 interviews directed to different age and socio-economic groups. Two different market areas in Michigan are being studied.

Based on the preliminary findings it is important that retail food stores market to consumer needs, not just segments of people. The needs are not the same all of the time and it is necessary to develop a strategy to match the needs. The present variables being utilized for relating image to shopper behavior are not adequate in today's market situation. The store selection process is based on interaction between a retailer's marketing strategies and the individual and situational characteristics of buyers. This means that retail food management must reevaluate their thinking and strategy concerning store image and shopping behavior, and consider the major changes in individual and situation variables that have occurred in recent years.

# One Way to Gather Information on Supermarket Customer Appeals

by

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## Problem Addressed

This study was the result of interviewing 152 customers at two supermarket locations in the same chain. Our plan was to gain customer reaction to the specific store characteristics in five different areas which include:

1. Convenience of reaching the supermarket
2. Physical characteristics of the supermarket
3. Personnel of the supermarket
4. Advertising by the supermarket
5. General characteristics of the supermarket

## Methodology

Keeping in mind the objectives, we designed our research to exemplify a descriptive design study. This design is typically used for performance feedback research which was exactly what we were looking for in trying to find consumer reactions to overall characteristics of the two supermarkets. To define further our research design, we designed a

brief questionnaire to obtain specific quantitative information with tolerable accuracy and completeness. The Likert Scale was utilized. The customer was given a scale whose position ranged from strongly disagree to strongly agree. This type of questionnaire allows for a large amount of questions to be asked within a small amount of space leaving the customer to believe it is shorter than it actually is. The questions were phrased in both positive and negative tones. The questionnaire was also self administered because it is preferable to put the survey in the customer's hand rather than expect them to understand this type of format by just simply listening to the interviewer.

## Conclusion

In general, this study presents a market research technique that we feel could be used very effectively to gather data to meet the general as well as the specific objectives of a supermarket organization. The technique is called the semantic differential. This technique may provide some comprehensive information, not only about customer attitudes towards one's own supermarket, but other competing supermarkets as well. Overall, our

marketing research survey was very complete in covering all aspects of both stores. In conducting the survey, we were confident that the results were accurate and the information gained was useful. It is commendable that each statement received a majority of positive responses.

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**Hedonic Price Analysis of Fresh Tree Fruits**  
**At the Retail and Producer Level:**  
**An Investigation of Nutrient Values and Experience Characteristics**

by

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**Problem**

In recent years consumers have become much more concerned with dietary needs and nutritional requirements. Accompanying this concern has been an increase in information regarding the nutritional content of many foods. Consumer theory would suggest that the prices paid for food items such as fruit would be a function of the nutritional characteristics. In this study, we consider whether price differences between various fruits can be explained by the differences in nutritional content. Another concern of the study is whether there are experience characteristics (taste, etc.) as noted by Nelson that may also be important in determining price differences. These characteristics have seldom been included in past analyses because they depend on human perceptual judgment and are difficult to quantify. Finally price differences at the

producer level and the consumer level are compared to determine the relative importance of these characteristics at the different levels of demand.

**Methodology**

Cross-sectional sets of prices are being collected for selected fruits at both the retail level and producer levels. These prices will be used for the hedonic price analysis employing a regression type model relating prices to selected nutritional characteristics and a proxy variable to represent experience characteristics. The explanatory model will be applied to both the retail and producer level prices thus allowing for a comparison of the model's explanatory power at the two levels in the marketing chain.

## Findings

The findings of this study may be useful to:

- 1) retailers and producers in determining the importance of nutrient values in the price of fresh fruits;
- 2) producers and researchers in determining how well characteristics that are important at the retail level are transmitted back to the producer level; and
- 3) retailers and producers in assessing the importance of experience characteristics in fresh fruit prices.

## Relevant Literature

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