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RESEARCH UPDATES

Chairperson: John Adrian, Auburn University

The Importance of Product/Consumer Attributes In Consumer Buying Decisions

S. M. Fletcher
University of Georgia

T. T. Fu
University of Georgia

A. V. A. Resurreccion
University of Georgia

Problem

Recently, product development and innovation are being highly promoted in the food industry as a means to increase the demand for food. With the presence of convenience foods as well as the increasing awareness of diet and health concerns, food products are becoming increasingly complex. This differentiation of food products induces the need for merchandising strategies for marketing food.

While consumer preferences toward alternative food products are important information for an effective marketing plan, the underlying product and consumer attributes are key determinant factors in consumer buying decisions. Therefore, the identification of product and consumer attributes as well as the evaluation of the impact of consumer preferences toward certain products with respect to those attributes are significant in food marketing.

Methodology

Two approaches, conjoint analysis and quantal choice analysis, can be employed for analyzing the significance of those attributes on consumer buying decisions. Both approaches assume that a consumer preference is a function of those attributes.

Conjoint analysis can sort out the relative importance of product attributes by a special factorial experimental design. In contrast, quantal choice analysis (such as logit and probit analyses) allows the interpersonal comparison of utility given the assumption that there exists a random utility function. This latter approach provides the ability to compute the selection probabilities and obtain consumer profiles.

Implication

Consumer perceptions and preferences toward alternative food products rely heavily on product and consumer attributes. Individual differences in preferences and the relative

importance of product attributes obtained via conjoint analysis would provide useful information in the design of a product marketing strategy for marketing food. The selection probabilities and potential consumer profiles obtained via quantal choice analysis can be used for predicting market share and for segmenting markets in the food industry.

Contact

Dr. Stanley M. Fletcher
Dept. of Agricultural Economics
Georgia Station
University of Georgia
Griffin, Georgia 30223-1797

Supermarket Produce Demand and Shelf Space Effects

John J. VanSickle
Food and Resource Economics Department
IFAS
University of Florida

German Molina
Food and Resource Economics Department
IFAS
University of Florida

Abstract

The problem of allocating scarce shelf space in supermarkets has been of interest to supermarket executives for many years. Effectively managing shelf space can be one of the most important merchandising tools produce managers use.

This study is intended to measure the impact shelf space has on sales of produce in supermarkets. This study will also show how shelf space can be used with other merchandising tools to increase produce sales. These results will be useful to produce directors of supermarkets for increasing profits in their stores. The results will be useful to shippers and commodity organizations for identifying methods to increase demand for their products.

Data are being collected for this study from three supermarket chains operating in north Florida. These chains are providing weekly sales data for 16 selected produce items sold in the produce department. The period for which the data are being collected are from mid-November, 1987 to mid-December, 1987. Other data being collected include the weekly measures of shelf space allocated and the types of shelf space used to display the items, the prices being charged for the items and merchandising activity data which include advertising, types of point-of-purchase materials used and space allocated to and prices charged for primary competitors of the products studied.

Additional data being collected include quality measures of the produce. These data are being collected from the produce buyers for the supermarkets. These data will be used with the store data in an econometric analysis to determine the effects of shelf space and other merchandising practices on the sales of produce in the supermarket.

The results of this analysis will demonstrate the usefulness of these types of analyses. The produce industry is currently conducting a project to determine the direct product profitability (DPP) for produce in supermarkets. That data with results from studies similar to this project will allow development of tools which supermarket managers can use in allocating shelf space to maximize store profits. Several models have been proposed as tools to be used by supermarkets to allocate shelf space, but little or no data has been generated for produce to use in these models. The results from this study will provide the foundation to conduct further studies that will allow produce departments in supermarkets to use these models.

Package Size Preferences for Meat and Poultry Products As Related to Demographic Characteristics

Tami J. Gundry
University of Delaware
Newark, Delaware

J. Richard Bacon
University of Delaware
Newark, Delaware

U. C. Toensmeyer
University of Delaware
Newark, Delaware

R. Dean Shippy
University of Delaware
Newark, Delaware

Objectives

To evaluate what consumer expectations and needs are with regard to package size of meat and poultry products.

Discussion and Preliminary Results

The demographic characteristics to be considered are: age, family size, income, occupation, and gender.

Ground Beef Package Sizes

The 65 and over age group makes up the largest purchasing group for the under one pound and the one to one and one-half sizes. This was followed by the 50-64 and 30-39 age groups respectively. The three to five pound package was preferred by the 30-39 age group. As the consumer gets older, the package size preferred decreases. By 65 most children are out of the home, and some people move to retirement communities which may have less storage space available.

Chicken Legs

The 50 plus age group buy a majority of the smaller package sizes, while the 30-39 year olds buy most of the larger sizes. The 40-49 age group is almost evenly distributed as to preferred package sizes, ranging from 18 to 21 percent from the smallest to the largest.

Occupational Characteristics

The one- to two-piece package size was preferred by the retired group with 30 percent; by the professional group with 23.5 percent; and by homemakers with 20 percent. The professionals indicated the highest preference for the three-, four-, and five- to six-piece package size--22, 30 and 28 percent respectively.

Professionals also expressed the highest percent (32%) preference for the three-pound whole chicken roaster. This was followed by the homemaker with 24 percent and office/clerical with 23 percent. The three- to four-pound roaster was preferred by 21 percent of professionals, 23 percent of clerical/office and 20 percent of homemakers.

Merrimack College to Offer Certificate Program In Food Retail Management

James J. Corbett
Associate Professor
Marketing Department
Merrimack College
North Andover, Massachusetts

Statement of the Problem

The purpose of this paper is to describe the evolution of a certificate program in Food Retail Management which will be offered this fall. The program involves Merrimack College, Becker Junior College and Cornell University as well as members of the food industry.

Methodology

On December 19, 1986 a meeting was held which involved personnel from both the food industry and the educational sector. This meeting was held at Merrimack College which is located in North Andover, Massachusetts. An initial proposal was presented by Mr. George Haywood of the Cornell University Home Study Program. This proposal involved the use of the Cornell Home Study courses

and weekly classroom instruction given at an educational institution.

The discussion at this meeting indicated that continuing education programs may be an effective vehicle in meeting some of the needs of the food industry. However, further investigation should be undertaken on the subject matter of instruction.

On February 27, 1987 a second meeting was held at Becker Junior College which is located in Worcester, Massachusetts. During this meeting, the New England Food Industry Education Council was established. The Council, chaired by Mrs. Nancy Friis-Hansen, formerly Director of Organizational Planning, Iandoli's Supermarkets Inc., Worcester, Massachusetts, is made up of a number of food industry training and personnel executives representing companies in the New England area as well as educators from Merrimack College, Becker Junior College and Cornell University.

The New England Food Industry Education Council's stated objective is to broaden the training and educational opportunities of food industry personnel and to expand the image of career opportunities within the industry. This is crucial in view of the severe staffing problems all food industry companies in New England face today.

At this meeting, the decision was made about which specific courses would be offered as well as the places, dates and times of the specific offerings. This meeting proved useful in establishing the Council and beginning the planning process in order to better meet the needs of the food industry.

Significance of the Food Distribution Industry

The food distribution industry is made up of a collection of individuals with jobs that have been established to fit together with the end result of selling food as well as non-food items to the general public. This lends itself to a one-on-one approach in the relationship between management and employees.

In my opinion, an assumption could be made that an employee generally works more or less in isolation with training and/or supervision from immediate superiors. Generally, the in-service training program offered to food industry employees by their respective companies have a broad and universal effect on all aspects of the total operation. But, despite the general opinion that these programs have been important, it is my belief that the lack of sufficient time can at times hinder full development of the in-service and continuing education training programs in particular companies.

With the advent of this new certificate program in Food Retail Management, a much needed dialogue concerning some of the training needs and opportunity areas has been established. This is not an end but rather a beginning that should be very fruitful in both the short and long run for all concerned.

Changes During Freezing, Storage and Simulated Distribution In Beef Roasts and Ground Beef Intended for Military and School Lunch Program Usage

B. W. Berry
Meat Science Research Laboratory
Agricultural Research Service, USDA
Beltsville, MD

J. L. Secrist
U.S. Army Research and Development Center
Natick, MA

E. C. Green
Food Quality Assurance Branch
AMS, USDA
Washington, D.C.

Problem

Frozen meat products purchased by the U.S. government for its many programs (i.e., school lunch program, military installations) must comply with certain requirements for freezing and frozen storage. Some meat processors contend that the regulations are unrealistic and more costly than commercial procedures. However, end-users such as the Defense Department have questioned whether even faster freezing than the regulations require would allow for some later temperature abuse during distribution and storage without product deterioration.

Methodology

Top round roasts, ground beef patties and bulk ground beef and patties containing 20 percent rehydrated soy protein were subjected to one of four freezing rates (0 F in 24, 48, 72, 96 hours). Ground beef was manufactured to have 20 and 18 percent fat in all beef and soy-extended product, respectively. After both 45 and 60 d of storage at either 0 or -10 F, one-half of all product in all treatments received a temperature abuse of 85 F for 4 hours. This step was performed to simulate loading out of warehouses. After the abuse, product was placed into one of three final temperatures (+20, 0, -10 F). Sensory, chemical, microbial, instrumental texture, cooking and yield evaluations were made just before and after freezing and following 6, 9, 12, 18 and 24 months of storage following freezing depending on the product.

Major Findings and Significance

Variations in freezing rate (time to reach 0 F) did not influence most characteristics studied. The greatest effect of freezing rate was on tenderness of beef patties, where faster freezing rates produced greater tenderness. This difference was even detected following frozen storage up to 12 months.

The temperature abuse used to simulate loading out of warehouses did not generally

affect the characteristics studied. Advancements in storage time produced negative effects on many product characteristics, but the changes were gradual.

The use of +20°F as a final storage temperature produced considerable deterioration especially in storage life indicators of color, odor and TBA values. It does not appear that faster freezing rates will permit the use of abusive storage temperatures such as 20°F and still prevent excessive product deterioration.

Contact

B. W. Berry
Meat Science Research Laboratory, Bldg. 201
BARC-East
Beltsville, MD 20705
Telephone: 301-344-1994

Consumer Awareness and Response to Restructured Beef Steaks

B. W. Berry
Meat Science Research Laboratory
Agricultural Research Service, USDA
Beltsville, MD

Problem

Development and acceptance of value-added products such as restructured steaks is an important goal of the beef industry. Excess connective tissue can cause textural problems in these products. Consumer awareness of and response to these products and the importance that consumers give to connective tissue in restructured steaks has not been established.

Methodology

USDA Choice, Yield Grade 2 square-cut chucks served as the raw material for the restructured steaks. No trimming of connective tissue was done. Restructured steaks were processed by a flaking and forming procedure.

A total of 350 consumers (equal representation between males and females) were selected from the Greater Washington, D.C. Metropolitan Area (GWDCMA) to participate in consumer response studies. Only consumers between 20 and 70 years of age were selected. Seven groups of 50 consumers (each group balanced as to sex and complying with the GWDCMA age distribution) responded to various questions concerning desirability, acceptability and gristle detectability in the restructured steaks. Steak samples were served to each group in a controlled setting following cooking to 70°C. Samples were served either as precut mouth size pieces or in strips which required the panelists to cut them prior to evaluation.

Major Findings and Significance

Respondents indicated they were collectively very infrequent consumers of restructured steaks. Consumers who were asked to identify desirable characteristics in the restructured steaks frequently mentioned texture and flavor. However, other consumers, when asked to identify undesirable characteristics,

frequently identified these same two characteristics as undesirable. Excessive gristle represented only 13.5 percent of the undesirable characteristics identified by consumers. However, 24 of 50 consumers in one group felt the test product contained more gristle than beef previously consumed. When consumers evaluated steak in precut pieces, rather than cutting pieces themselves, they felt the product had more gristle than beef previously consumed.

When asked to describe the acceptability of the test product as "very," "just" or "not" acceptable, depending on the test group, between 54 and 66 percent of the responses marked were "just" acceptable. There are indications from the study that consumers may have difficulty in identifying gristle in this type of beef product or, if gristle is present, the product may not necessarily be unacceptable.

Contact

B. W. Berry
Meat Science Research Laboratory, Bldg. 201
BARC-East
Beltsville, MD 20705
Telephone: 301-344-1994

Regional Trends and Spatial Characteristics Of the U.S. Food Industry

Summary of paper presented at the Research Up-Date Session of the
1987 Food Distribution Research Society Meeting, Williamsburg, VA. October 13, 1987.

C. M. Gempesaw II
Assistant Professor
Department of Food and Resource Economics
University of Delaware

J. Richard Bacon
Research Associate
Department of Food and Resource Economics
University of Delaware

Over the past three decades, the U.S. food industry has experienced various shifts in regional farm production, marketing supply, and consumer demand. These shifts have occurred as a response to changing socio-economic and demographic conditions. The objec-

tive of this study is to analyze the regional trends and spatial characteristics of the U.S. food industry during the last 35 years. The United States is divided into eight regions and food products are assumed to be separable into seven product groupings. An intersectoral analysis was conducted by dividing the industry into the farm, marketing and consumer demand sectors. This study provides important information concerning the surplus and deficit trends of food products by region and sector.

The Northeast region is generally a net deficit region in all food products especially in grains, non-food products and meat animals. The closest the Northeast comes to self-sufficiency is in dairy products. The South Atlantic region is heavily dependent on other regions for its meat animals, food grains, and dairy product requirements. However, it compensates for its deficiencies by being one of the largest producers of fruits and vegetables, poultry and eggs, and non-food products. The East North Central region is a net deficit region for all products except dairy products and food grains. It accounts for over 30 percent of the nation's dairy production. The East South Central region appears to be a self-sufficient region in meat animals, poultry and eggs, food grains, and non-food products, while it is very insufficient in fruits and vegetables and slightly deficient in dairy production.

The West North Central region is a major producer of feed grains, meat animals, and food grains. It is insufficient in fruits and vegetables and non-food products. The West South Central region is relatively self-sufficient except for dairy and fruits and vegetables. The Mountain region is not only the most rapidly growing region in the country, but is also generally a self-sufficient region except for poultry and eggs. The Pacific region is highly deficient in meat animal and food grain production, and is also deficient in dairy, poultry and eggs, and non-food products. A complete discussion of procedures and empirical results are available in a forthcoming bulletin to be published by the authors.

Computer Assisted Grocery Store Management Systems: Needs, Access, Assimilation and the Role for Universities

George K. Criner
Department of Agricultural and Resource Economics
University of Maine

Problem

This research, which will being within the next year, will start with an assessment of the assimilation of computer analysis systems into grocery store management decisions. The computer systems of primary concern are those which aid in shelf space allocation,

cost, and direct product profit (DPP) analysis. The research will examine acceptance, performance, and satisfaction with various systems and will consider the role of university researchers in developing and evaluating systems and educating the grocery industry in this area. The research will primarily focus on the smaller and intermediate size grocery stores which may lack the technical expertise and resources of the larger stores.

As the real cost of computer hardware decreases and the number of firms producing analysis packages increases, grocery stores will begin to adopt such systems--with or without a careful assessment of their needs. Research in this area may help ensure that the computer systems created meet the needs of the industry as closely as possible. This will increase efficiency of adoption and use and will help firms producing such systems better meet the needs of their clientele.

Methodology

At least one survey of Maine grocery stores will be conducted with follow-up interviews expected. Depending on several factors, a computer analysis system and/or some educational programs may be developed.

Findings

The planned research will provide information as to whether computer aided management systems are correctly responding to the needs of small and intermediate Maine grocery stores. Trends in related computer hardware and software and industry acceptance will be analyzed. This will help in the transmission of information between the industry and individuals and firms working in the field of computer aided management systems.

Contact

George K. Criner
Assistant Professor of
Agricultural and Resource Economics
206 Winslow Hall
University of Maine
Orono, ME 04469
(207) 581-3152

The Use of AI (Artificial Intelligence) in the Selection Of the Site of a Supermarket

Angelo E. Di Antonio
Towson State University
Towson, MD

Ulrich C. Toensmeyer
University of Delaware
Newark, Delaware

Artificial intelligence includes robotics, natural language communication and expert systems. We have chosen to use an expert system to assist with the selection of the site of a supermarket.

We used VP-Expert published by Paperback Software for our system. VP-Expert is a relatively inexpensive package that runs on a microprocessor. It is "user-friendly" that is easy to learn and easy to use.

There are four components to an expert system. It is necessary to have a knowledge base which includes research as well as contact with an "expert." The knowledge base consists of facts about a specific topic and rules for using those facts.

Once the knowledge base has been encoded, the next step is to use it. A computer program called the inference engine is the part of the expert system that does this. Each of the queries are submitted on an "If . . . then" basis. The "If" would be a "condition." "Then" is an action that takes place if the condition is met.

The third component of the expert system that provides communication between the inference engine and the system user is known as the User Interface.

The fourth component of the system is the explanation facility. This permits the user to query the system about why a question is being asked. This helps the user understand why certain questions are asked. This would be similar to having the opportunity to query an expert during the decision making process.

The system developed for the selection of a supermarket would serve as a screening device to the supermarket operator. The knowledge base includes demographics, census data, economic factors, proximity and type of competition. The system must be used with great care and the results must be scrutinized by an "expert."

Effects of the Immigration Reform Control Act of 1986 On Fruit and Vegetable Producers and Processors

H. L. Goodwin
Department of Agricultural Economics
Texas A & M University
College Station, Texas

Problem

The Immigration Reform and Control Act of 1986 (IRCA) introduced sanctions against employers who knowingly hire unauthorized aliens and set requirements/guidelines for legalization and work authorization for aliens wishing to obtain legal status. Rationale behind IRCA focused on job restriction as a dis-incentive to illegal immigration. Following this line of thought, success of IRCA will ultimately depend upon employer compliance with the law. But compliance is generally dependent upon enforcement capabilities.

Based upon past behavior of government agencies, one can anticipate enforcement to be targeted in specific industrial sectors and geographic areas. Preliminary review of the U.S. Census of Industries, U.S. Census of the Population, Census of Manufacturers, U.S. Census of Agriculture, and the Hired Farm Work Force of 1985 indicate the presence of a large number of illegal aliens in both the production and processing phases of fruits and vegetables, particularly in certain areas of the United States.

Method

Use secondary data sources to describe, identify, and estimate the magnitude of illegal and unauthorized aliens in fruit and vegetable production and processing. Based upon this information, we plan to incorporate wage rates, work force availability, and estimates of sanction enforcement to derive potential effects on producers and processors.

Contact

H. L. Goodwin
Department of Agricultural Economics
Texas A & M University
College Station, Texas 77843-2124