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# Consumer Preference Research in the Department of Agriculture 


#### Abstract

By James A. Bayton In this review of the consumer preference work that has been carried on in the Bureau, the author covers the purpose, the scope, and selected findings. The program of research provides data which can be beneficial to producers, processors, wholesalers, retailers, and consumers.


IT SEEMS SAFE to say that among those who work in the fields of social psychology and applied psychology, the research on attitudes conducted by the Bureau of Agricultural Economics is well known. This research falls into ree periods. It originated late in the 1930's as n aid to administrators of the Department of Agriculture in developing programs for assisting farmers. It was thought that the work would be more effective if there was systematic understanding of attitudes of farmers toward the existing situation and the programs being tried or proposed.

The second period extended through World War II when the research was centered upon agricultural problems arising because of the wartime situation. Concurrently the facilities were made available to other Government agencies. Among the studies at that time was the attitudinal research on War Bonds and the War Bond drives. Now the research is in its third stage and is concentrated upon analysis of consumer preferences.

The three periods reflect the nature of the basic problems of their times-depression, war, and now the threat of agricultural surpluses in this country. One approach toward alleviating that possible situation is an increase in the consumption of some of the products involved. This accounts for the current emphasis on consumer preferences. Interest in this work is being continuously ex-
pressed by the advisory committees established under the Research and Marketing Act, which, incidentally, provides most of the financing for the current consumer preference studies.

One of the major features of the present program of analysis of consumer preferences is its direction toward classes of products, rather than toward specific brands within a product-class as is done in much of the commercial consumer research. This generic approach permits a much more comprehensive investigation of the product-class than is found in many consumer studies. In fact, the reactions of consumers to a brand are a part of their reactions to the entire class of which the brand is a part. Concentration upon the narrower aspects of the individual's reactions to specific objects within a class carries with it the danger of missing what could well prove to be the more important factors to be considered when trying to improve the utilization of given products. Fundamental to this approach is the aim to obtain data that will be beneficial not only to one specific group, say retailers, but that can be used by producers, processors, wholesalers, retailers, and consumers.

Within the framework of this generic approach an attempt is made to uncover the basic psychological dynamics involved in consumers' attitudes and behavior. Attention is given to learning the
meaning of the product-class to the consumers and the motivations, both positive and negative, which operate with respect to the products. Because of the generic and dynamic aspects of this research, it can perhaps be characterized as both comprehensive and intensive.

Another feature is the cooperative basis on which each project is developed. Involved in the planning of each study are specialists in the product area, as well as agricultural economists, home economists, marketing specialists, and psychologists. This permits each study to be designed in terms of the major dimensions important to it. Not all of this research is carried on by the immediate staff. In some instances, members of other Divisions within the Bureau are responsible for gathering data on phases of the problem. Some projects are contracted to private research organizations under provisions contained in the Agricultural Research and Marketing Act but they are developed on the same cooperative basis as those done in the Department.

In general, the method used in these consumer preference studies involves the use of area sampling; open-ended interviewing is used when the dynamic aspects of a problem are explored.

## Specific Studies Regarding Foods

In the following description of several projects that have been conducted by the Bureau emphasis is placed upon the problems attacked and the methods used rather than upon the results of the surveys.

Dehydrated Foods.-One of the first of these consumer preference studies, made in 1944, had to do with consumer acceptance of dehydrated foods. This was part of a larger project of the Department of Agriculture and the War Food Administration relating to postwar readjustments in processing and marketing facilities and methods. An attempt was made to assess the prospects for dehydrated foods during the postwar years, a step deemed vital to the industry because of the tremendous expansion in production of these foods during the war. The consumer study was one part of an analysis of the entire industry-including productive capacity of plants, difficulties in marketing and transportation, commercial sales, and institutional usage (1). ${ }^{1}$

[^0]Because housewives generally were not familiar with dehydrated foods a survey was conducted Chicago in which several of these products were given to a sample of households. The survey was designed to answer the following questions. (1) Will housewives be willing to buy dehydrated foods if they are made available? (2) Which dehydrated foods are most likely to be bought? (3) How do housewives think they compare in taste with fresh and canned foods? (4) What advantages and disadvantages do housewives find in their use? (5) Do housewives think dehydrated foods differ in nutritional value from fresh and canned foods?

In a sample of 431 Chicago households (selected by area sampling) each housewife was given three of the following dehydrated foods: dried white potatoes, riced white potatoes, sweetpotatoes, beets, carrots, cranberries, eggs, and milk. The families were given enough of each to serve more than one meal so that different recipes could be tried. On the first visit the housewife was interviewed to learn the extent of her experience with dehydrated foods and her attitudes toward them. Two weeks later each was revisited to learn her reactions to the products that had been given her.

While this study was under way, an experiment was made in Chicago to learn the effectiveness demonstrations on willingness to buy dehydrat foods. Women from high and low socio-economic neighborhoods took part. (The samples were separate from the survey.) Experimental groups attended demonstrations by home economists; control groups did not. Both groups were given dehydrated foods to use at home and were later asked about their attitudes toward them.

The next year, in 1945, a survey was made in Houston, Tex., regarding consumer acceptance of dried milk (2). The situation there provided an opportunity for studying this product, divorced from the possible bias created in Chicago by giving the item to the housewives. Houston was located within the southern deficit milk-producing area and dried milk (whole and skim) was being sold in retail grocery stores. The general objectives of this study were to ascertain: (1) Extent to which housewives were aware that dried milk was available, (2) extent to which they were buying it and reasons for buying or not buying, (3) experiences these people had in using it, and (4) extent they expected to continue using the prod-
uct if fresh milk should be in plentiful supply. The major problem in sampling rested on the fact that information was not available on the rate of buying per households in the city. Interviewers made calls at 1,500 dwelling units, in the metropolitan area, which had been selected by area sampling. All homemakers who had bought dried milk, but only a subsample of those who had not bought it, were interviewed. Households in the two samples numbered 253 buyers and 479 nonbuyers.

To supplement the information from consumers a survey was made of 60 independent retailers of dried milk to learn their experiences in selling it. In addition, a member of the marketing research staff of the Bureau interviewed the executives in charge of merchandising in the six Houston chain stores. The integration of the data from the three sources-household consumers and nonconsumers, independent retailers, and chain-store executives-gave insight into the problems of marketing dried milk ( 3 ).

Potatoes.-Problems of the potato industry have become acute through the combined effect of a declining per capita consumption and an increase in production. One phase of the research directed toward these problems was a study of consumer references with the thought that the information obtained could aid in developing improved marketing methods. Collaborating in planning this project were the BAE, the PMA, the Bureau of Human Nutrition and Home Economics, and representatives of four State agricultural experiment stations.

Beginning in 1947 and continuing into 1948 a national survey of potato preferences was made among household consumers (5). It covered the (1) use of potatoes, potato substitutes, and processed potatoes, (2) buying potatoes for external characteristics, size, and cooking qualities, (3) buying by grades and brand-packaged potatoes, (4) cooking habits, and (5) storage problems.

The universe from which the sample was drawn was all of the private households in the United States in cities of 2,500 and over. The sample ( 3,306 households) was so designed that separate analysis could be made for the South and for each of three cities-Boston, Chicago, and Los Angeles. The South was selected because of differences in food habits between that area and the rest of the country. The three cities represented differences
in patterns of supply-the Boston market receives most of its potatoes from Maine; Chicago's come from nearly all of the potato-producing areas; the supply for Los Angeles comes primarily from California and Idaho. The very small towns and rural sections were excluded from the sample to eliminate those households that used home-grown potatoes. The interviewing was done during November, December, and January, when the late crop was available. This crop made up about 80 percent of that year's production of potatoes. The respondents were those persons in the sample households who had main responsibility for buying and preparing food. Excluded from the sample were those households that had boarders, or in which no meals were prepared, or in which potatoes were not used.

During 1948 another survey was designed to study potato preferences among certain commercial users-restaurants and hotels-as they buy on a larger scale and they, too, buy different types and sizes (7). The sample points were New Orleans and Cincinnati, selected because they represent different situations with respect to consumption of potatoes. For example, Cincinnati is a high-consumption area, just as New Orleans has a low consumption, and competition between potatoes and foods like rice is greater in New Orleans.

Within each city the sample was selected as follows. All establishments that were classified as public eating places were listed and from this list all hotels with public dining rooms and all chain establishments (three or more units under the same management in a city) were selected. From the remaining list a random selection was made. The New Orleans sample consisted of 10 hotels, 8 restaurant chains, and 232 independent restaurants; the sample in Cincinnati had 16 hotels, 11 chains, and 225 independents. The respondents were those persons who were responsible for buying potatoes for the establishments. Usually this was the owner or manager; in some places it was the chef or cook (sometimes the job was delegated to waiters or bartenders).

Rice.-A national survey of rice preferences among household consumers was made during a 2 -week period, in October 1948. The interview covered such matters as reasons for using or not using rice, ways it is used, preferences regarding length of grain, cooking methods and cooking difficulties, preferences for white and brown rice
and opinions on nutritive value of each, size and frequency of purchases, and preferences for proccessed rice such as breakfast cereals. The universe sampled was all of the private households in the United States. In addition, a special sample was drawn for metropolitan Chicago to permit analysis of the problem in a large cosmopolitan center. The total sample consisted of 2,450 households.
Apples and Pears.-Another project explored consumer preferences regarding apples and pears. Taking part in planning this study were members of the Bureau, the PMA, and the Farm Credit Administration. State experiment stations and universities in areas that produce commercial apples were consulted. The National Apple Institute provided certain technical data. Items studied included purposes for which apples are bought, characteristics sought in apples and pears, uses made of the products, uses made of commercially prepared apples (canned, dried, etc.), and qualities desired in apples to be served in different ways.

The national sample was similar to the one used for rice, except that the design permitted a separate analysis for Chicago and for Philadelphia. Interviewing in the 2,573 households took place during January, February, and March 1949, at the peak of the marketing season for the 1948 apple crop.

Citrus Products.-Another series of surveys involved citrus products. The first research was a pilot study conducted in Louisville and Nelson County, Ky. (8). The primary considerations in selecting these sample points were that an urbanrural analysis was desired and that the points of study should be on direct transportation lines from the major citrus-producing areas. The sample in Louisville was drawn from all the private households within the city limits. The Nelson County universe was all private households except those in the one town that had a population exceeding 2,500 . In Louisville, 497 homemakers were interviewed; in Nelson County, 538 homemakers.

This survey attempted to ascertain the characteristics of users and nonusers of citrus products, the motivations involved in either, changes in quantities used, per capita consumption, and certain merchandising preferences. Simultaneously, a study was made of samples of stores in Louisville and in Nelson County, to obtain descriptions of the fresh and processed citrus products
offered for sale, including such items as the type of product, sizes, and methods of sale.

In both the Houston survey on dried milk and the Louisville-Nelson County study on citrus products, information from samples of retail grocers in the respective localities was correlated with the data obtained from the consumers. The project to be described now represents a systematic attempt to explore the attitudes and behavior of consumers of citrus products with respect to specific stores. This research was done in collaboration with the Texas Agricultural and Mechanical College. It centered upon those customers of two large supermarkets in Houston who lived within the area in which the stores are located. Data collected independently in these stores were correlated with the results of the consumer survey. This work was done in May and June 1949.
The location of the two supermarkets in a relatively distinct and separate part of Houston, with practically no other grocery stores in the district, gave an unusual opportunity for research permitting the coordination of store and consumer data. The stores, which were in the major shopping center for the area, approximately 19 by 21 blocks, stand side by side. The universe from which the sample was drawn included all the estimated 5,900 private dwelling units within this distric A random sample of the blocks in the area was drawn at a sampling rate designed to yield approximately 300 homemakers who had shopped at one or both of the stores within the 2 weeks just before they were interviewed. All of the dwelling units within each sample block were visited in order to locate the customers of the stores. It should be noted that this was not a sample of the universe of customers of the stores.
The purpose of the consumer survey was to learn certain facts regarding these particular homemakers:
(1) Purchasing patterns for citrus products and other fruits, including products bought at the two supermarkets or elsewhere.
(2) Consumer attitudes toward citrus products, including whether homemakers view these products as a distinct class within all fruit or as items within the broad category of fruit; whether they think of citrus products as unique (in terms of food value) or as having little or no real differences.
(3) Specific preferences, such as color of fresh grapefruit and grapefruit juice; sweetened and
unsweetened juices; packaged and loose fresh trus products; pricing by count and by weight. Reasons for preferences were asked.

By use of the method of paired comparisons, six products (fresh oranges and grapefruit; canned orange juice, grapefruit juice, and blends; and frozen orange juice concentrate) were scaled in terms of taste preference.
(4) Decision-making in buying citrus products, including the role of advertisements, planned vs. impulse buying, and aspects of the products entering into the decision.

These data were integrated with a great deal of information gathered in the two supermarkets, thus giving a comprehensive picture of the storeconsumer relationship in terms of a specific set of products and conditions.

A study was made of consumer preferences for three types of canned blends of orange and grapefruit juice, in 1949. The three were a blend of 60 percent orange juice and 40 percent grapefruit juice; of 50 percent orange juice and 50 percent grapefruit juice; of 40 percent orange juice and 60 percent grapefruit juice. This survey was conducted under contract by a private concern. The outstanding feature was the use of an experimental design with a national panel of households interviewed by a mail questionnaire. The panel vas made up of 2,106 families selected to represent a cross-section of the United States. In addition, the sample permitted analysis of the data in terms of three regions into which the country was divided for the purpose-eastern, western, and southern. In each of these regions 162 families (control groups) were given three cans of citrus blend all of which contained the same proportionate mixture; that is, all three cans were either a $60-40,50-50$, or $40-60$ percent mixture of orange juice and grapefruit juice. The remaining 1,620 families (experimental group) were given three cans of juice, one each of the different mixtures. The three cans were identified by a triangle, circle, or square printed on the label.

The homemakers were asked to serve the three juices to each member of the family on a Sunday morning before breakfast. Separate slips with the three markings were provided so that each glass of juice could be identified. The sequence for tasting the juices was randomized throughout the experimental and control samples. The juice was to have been kept in the refrigerator the night
before and no ice was to be added at time of serving. The reactions of all members of the household over 5 years of age were obtained. Moreover, the panel homemakers were questioned about their past use of canned citrus juices and their likes and dislikes concerning them.

## Specific Studies Regarding Textiles

Another series of consumer preference studies now under way has to do with textile products and clothing. The need for such studies is similar to that which led to the research on food products.

Women's Preferences Among Textiles.-The first study had to do with women's preferences for various textile products (4). It was intended to furnish information as to what women consider desirable or undesirable about cotton and other fibers as these products appear in clothing and household textiles. Some of the phases covered were: (1) Extent to which women buy readymade clothing (house dresses, one-piece winter dresses, etc.), (2) extent to which they buy certain items of household textiles ready-made (tablecloths, dishtowels, etc.), (3) fiber preferences among women who buy ready-made items (clothing or household), (4) characteristics which women seek and deem most important in ready-made items (appearance, durability, etc.), and (5) specific likes and dislikes with reference to cotton and rayon in ready-made clothing.

The sample was designed to be representative of all women in the United States between 18 and 65 years old and of all homemakers regardless of age. Whenever a household was found that had more than three women who met the requirements only three were interviewed. The sample, drawn on an area basis, consisted of 1,782 respondents.
In an analysis of the resulting data use was made of the concept of salience as an approach to ascertaining the importance attached by the women to specific characteristics of the products. Two types of questions were used to get at this point-checklist questions and open-ended questions. One open-ended question was: "What are the most important things you look for in buying a one-piece winter street dress?"

Spontaneous answers given to such a question indicate characteristics of the item which are most prominent in the thinking of the respondents at that time; that is, those which are salient for them.

The open-ended questions were supplemented by checklist questions in which respondents were asked to select one answer from several. For example, they were asked to choose the three statements from a list of eight which represented what was most important to them when buying a one-piece street dress. These checklist items were: (1) Is nice looking; (2) Is not expensive; (3) Will wear well; (4) Is the right weight; (5) Will dry-clean well; (6) Is practical and comfortable in cut; (7) Won't fade in the sun; and (8) Will wash and iron well. These questions came at the end of the interview-the corresponding open-ended questions were asked in the early part of the schedule. In each instance the question was structured in terms of importance to the purchasers, to offset the criticism that salient responses are not necessarily valid indicators of degree of importance to the respondent. By using the checklists the respondents were given a chance to select characteristics which might not have been thought of spontaneously but which they did consider important.

The relative salience of the various characteristics which were said to be important was represented by the "ratio of salience." First, the proportion of the respondents who mentioned a given characteristic as being important in reply to the open-ended question and the corresponding checklist question (counting only once those who gave the same answer to both questions) was determined. This proportion was designated as $T$. The proportion of the respondents who gave the particular characteristic spontaneously in answering the open-ended questions was found and indicated as $S$. The ratio of salience is $\frac{S}{T}$.

By way of illustration- 47 percent of the respondents who bought ready-made one-piece winter street dresses gave in reply to both types of questions the answer, "practical and comfortable in cut" as an important characteristic they sought. In answer to the open-ended questions 25 percent gave this characteristic spontaneously. The ratio of salience for this item was 0.53 . "Right weight" was the characteristic given by 47 percent of the respondents in reply to the two questions; 14 percent gave this reply spontaneously in answer to the open-ended question. The ratio of salience for this characteristic was 0.30 . We find, then, that although the total proportions
were the same ( $T=47$ percent in each case) the difference between the two ratios of salience ind cates that in this type of dress "practical and comfortable in cut" is more important to these consumers than "right weight". The rationale for this conclusion is based upon the fact that the former characteristic was relatively more salient among those for whom it was important than was true of the salience of the latter characteristic among those for whom it was important.

Children's Clothing.-Another survey was directed toward mothers' preferences among selected items of children's clothing.
This survey can be used to illustrate a problem which plagues all open-ended interviewing-partial or incomplete answers. A systematic attempt was made to alert the interviewers to this difficulty. The "Interviewers' Instruction Manual" had a section of statements which were to be probed with respect to reasons either for preferring garment characteristics or for preferring different fibers. In addition to itemizing the responses, the basic levels to which the respondents were to be "pushed" were given. For example, a reply of "it's dressy," given as a reason was to be probed to see whether this referred to style, color, material, or fit. A reply of "launders well," was to be probed to get at whether this referred to dir coming out easily, or material not having to bo ironed, or that it dried quickly.
Men's Clothing.-Two surveys had to do with men's preferences for certain clothing items. The first of these (6) included shirts, extra trousers, summer suits, socks, pajamas, underwear, robes, and raincoats. Only owners of these items were questioned in detail about them. The general aims were to ascertain: (1) Preferences for competing fibers in the various articles of clothing, (2) beliefs regarding advantages and disadvantages of each of the competing fibers, (3) characteristics of finished garments that are considered important by consumers, (4) sources of dissatisfaction with particular items of clothing, and (5) person responsible in a family for actual selection of such items.

The sample was representative of all males in the United States living in households, who were 16 years or older. The households were selected on the usual area basis. If more than three men in a household fitted the criterion only three were interviewed. The sample was so designed that
an urban-rural analysis as well as analysis of the puth could be made.
The other project concerned men's preferences among woolens, worsteds, and weaves. In recent years demand for clothing made of fine grades of wool has increased while surpluses of medium and coarser grades of wool have accumulated. There have been shifts in the styles in men's clothing also. Manufacturers of men's clothing have not known whether they were trying to cope with problems arising from short-term price trends or with the influence of long-range trends in style. This survey represented an exploration of the psychological dynamics involved in one aspect of consumer buying behavior which would be of use to wool producers, manufacturers, and retailers.

The purposes were to ascertain: (1) Ownership of suits (year-round and summer), separate jackets, overcoats, topcoats, (2) why men buy particular kinds of year-round suits, (3) men's preferences with respect to summer suits, (4) men's understanding of the terms "tropical" and "tropical worsteds," (5) causes of the increase in sales of separate jackets (sports jackets), (6) kinds of materials preferred in year-round suits and reasons for these preferences.

The universe from which the sample was drawn onsisted of all males in the United States 16 ears of age or over. The sample was drawn in in terms of the South, the North, and the Pacific Coast. Approximately 2,700 men were interviewed; but not more than three were interviewed in any one household.

Of the series of consumer preference surveys, the interviewing was, perhaps, most intensive in this one; that is, many more open-ended questions were used and the non-directive probing of responses was emphasized to the interviewers because the analysis of the problem required a knowledge of the value-judgments used by men in selecting within the items mentioned.

The combination of open-ended questions and intensive non-directive probing brought out value statements (both positive and negative) about prices, style, fit, durability, and other items.

In order to be objective in ascertaining men's preferences for kinds of materials in year-round suits the interviewers had two cards of samples of materials. Card A had samples of four types of woolen materials frequently used in men's suits;
they were of fine grade and were about the same color. Card B had samples of three materials not used frequently in suits; they were somewhat coarser than the materials on Card A. The method of paired comparisons was used with each card to learn the order of preference for the respective sets of materials among these men. Furthermore, an expression of preference was obtained between the materials preferred most frequently on Cards A and B, and the reasons were explored.

## Generalizations

In concluding, some generalizations may be in order concerning the results of these consumer preference studies. To this writer the outstanding findings have been those showing the importance of quality in the opinions of consumers at the present time. Although price considerations, as demonstrated by negative statements about prices of the products and correlations between their use and income data, definitely are influential, the potency of the consumer's idea concerning quality apparently is primary. For example, 44 percent of the homemakers in the national potato survey (5) said they would buy fewer potatoes if they were of poor quality and relatively low in price. On the other hand, only 12 percent said they would buy less if the potatoes were of good quality and the price was relatively high.
It is true that the criteria of quality used by homemakers might not always be technically realistic, but it cannot be ignored that they function in the consumer's decision-making. Furthermore, the evaluation as to the quality of a product seems likely to take place in terms of external appearance, in terms of the way the product looks.

With respect to foods, the criteria of quality are used by homemakers to imply the value of the product in terms of taste and health. In regard to health there appears to be a growing appreciation of foods in terms of nutrients (particularly vitamins) but only a sketchy ability to deal with specific food-values (in regard to the specific vitamins, etc.).

One result of interest in the study on citrus products in Houston was obtained by using the method of paired comparisons for ranking six products in terms of preference in regard to taste. Frozen orange juice concentrate, although relatively new, is making rather remarkable progress
in sales, but this analysis showed that fresh citrus products (oranges and grapefruit) ranked considerably higher than processed products in the opinions of the respondents. However, among the processed items this new product ranked highest. Repetitions of this technique will yield a measure of any changes in the position of this product as time passes and the effect of such changes upon the positions of the other citrus products, and regional and socio-economic differences in the ranking of these products can be disclosed through application of this technique.

An over-all evaluation of this research on consumer preferences indicates that from the viewpoint of action-research the results of such studies are of value to Government administrators and to the private interests involved (consumers, retailers, wholesalers, and growers).

The integration of the findings into the systematic economics of demand-analysis appears to rest, however, on somewhat tenuous grounds. Whereas these studies contribute to our knowledge of consumers with respect to productclasses (citrus fruit, potatoes, men's clothing, etc.) we still need to develop a systematic conception of the principles involved in the behavior of consumers, which includes the psychological and sociological variables that are most certainly operative in influencing the behavior of consumers, irrespective of product-class.

One of the sources of these limitations might be found in the difficulty two groups of researchers have in communicating with each other-the economists and the "preference-analysts." Each group represents, on the surface, a separate discipline. Each has its frame of reference. Each has its research tools. But, the two groups inevitably must overlap-with only one problem emerging where it had seemed that two existed. At present, apparently there are not enough people who are individually highly skilled in the two disciplines; it could hardly be otherwise since formal training in such a synthesis is rarely offered. How many of the agricultural economists who are interested in consumer preference research have had more than surface exposure to those areas of psychology which are important in this field? And, how many psychologists interested
in consumer preference research have had more than surface exposure to economics?

For the moment the way seems to lie in the direction of even closer cooperation between the representatives of the two fields. Such cooperation should strengthen the work since the joint effort will lead to better understanding of consumer behavior than one field can contribute alone. This better understanding is desirable not only from the scientific standpoint but also in order that the results of consumer preference-anddemand studies may be more useful and valuable to the Government and private interests involved.

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[^0]:    ${ }^{1}$ Italic figures in parentheses refer to References, p. 112.

