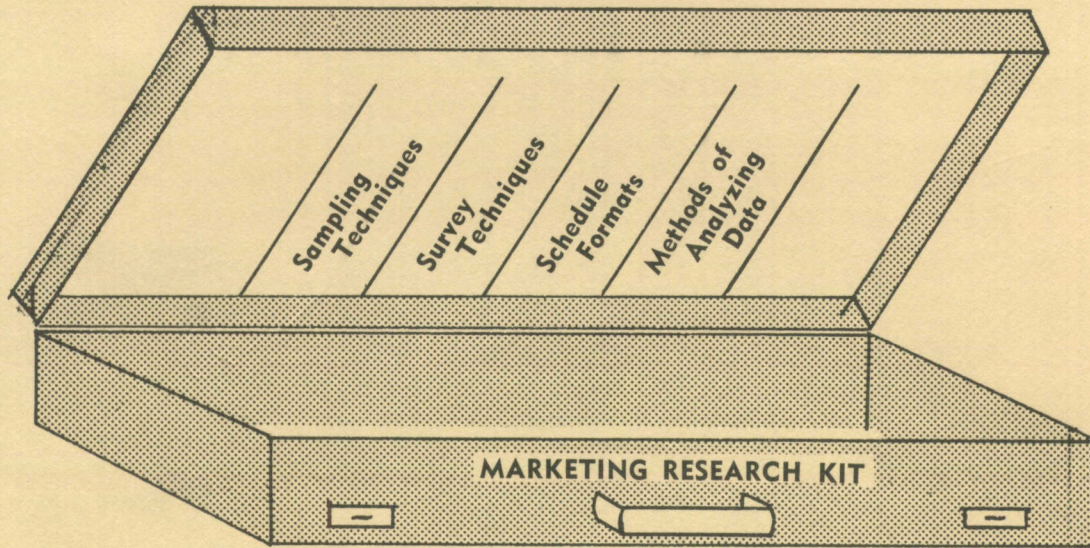
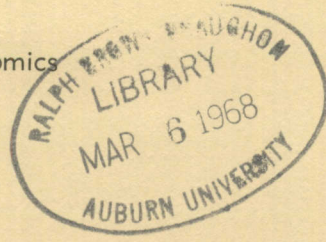


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Market Research Methods and Procedures Used in Southern Regional Beef Marketing Projects

Agricultural Experiment Station
of Auburn University

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Preface

This publication is a summary and description of the Marketing Research Methods used by Agricultural Experiment Station Research personnel in the Marketing Research phases of Southern Regional Marketing Project SM-19. Each member of the current SM-19 Technical Committee made valuable suggestions that enhanced the development of the manuscript, and special recognition is due Dr. Jessie Mize of the University of Georgia for her contributions to the publication. Permission was given by the SM-19 Technical Committee for this report to be published as a departmental report.

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H. A. Steward (1956-1961)

GSRS Representative: Paul Jehlik

The following personnel have served as voting members of the Technical Committee at some time since its inception in 1956. Most recent are listed first. Alabama, R. S. Glover, M. J. Danner; Georgia, Jessie J. Mize, Mary Speirs; Louisiana, A. M. Mullins, Mary Fielder, Betty L. Woods, Ruby Whitehead, Dorothy Moschette, Clara Tucker; North Carolina, H. B. Craig, T. N. Blumer; Oklahoma, L. E. Walters, R. L. Hendrickson; Tennessee (currently inactive), J. W. Cole, Bernadine Meyer; Texas, G. T. King, O. D. Butler, and Virginia, R. F. Kelley, M. E. Juillerat.

MARKET RESEARCH METHODS AND PROCEDURES USED IN
SOUTHERN REGIONAL BEEF MARKETING PROJECTS

Robert S. Glover 1/

A southern regional research project², Motivating Factors and Consumer Purchases of Beef as Related to Objective Measurements Used to Predict Beef Acceptability was begun in 1956. This project was designated as Southern Marketing Project 19 and is referred to as SM-19 by Agricultural Experiment Station personnel throughout the Southern region.

The objectives of the project at its beginning were:

1. To identify and evaluate decision-making factors in block beef purchases.
2. To identify and evaluate characteristics suitable for predicting eating quality of beef.
3. To integrate such characteristics into grades.

The regional project was revised in 1962 to "Quality of Beef and Factors Motivating Beef Purchases." The revised project has as its objectives:

1. To determine quality of beef affecting market acceptability.

1/ Assistant Professor of Agricultural Economics, Auburn University.

2/ State Experiment Stations originally participating in the project were Alabama, Florida, Georgia, Louisiana, Mississippi, North Carolina, Tennessee and Texas. The Florida and Tennessee Experiment Stations no longer actively participate in the project.

- a. Characterize chemical, physical, and sensory properties of beef tissue.
 - b. Relate these properties to each other and to such factors as age, sex, conformation, post-mortem processing, and degree of fatness.
2. To determine factors motivating purchases of beef in consumer populations using various forms as:
 - a. Conventional cuts closely trimmed.
 - b. Boneless cuts closely trimmed following muscle structure.
 - c. Varying composition of ground beef.
 - d. Other variations in composition, cutting and merchandising methods.

A number of consumer marketing projects have been conducted in accordance with objective one of the initial project and the second objective of the revised project.

The purpose of this publication is to enumerate and summarize the marketing research methods and procedures used pursuant to the Consumer Marketing phases of SM-19 and SM-19 revised. The information included herein may be of interest to firms in the meat industry, individuals engaged in market research, and students concerned with the methodology of market research.

CONSUMER SURVEYS CONDUCTED BY SM-19 INVESTIGATORS

Consumer (or household) surveys are widely used by social scientists and market research analysts as a technique to gather information from external sources. Typically information is obtained from a sample of

respondents that is intended to be representative of a larger group, which is referred to as a population or universe. Attributes or characteristics of the population are frequently inferred from the information furnished by the sample of respondents. While the information obtained from surveys is a combination of facts, opinions, or both, it is nonetheless often unavailable from other sources. Consequently, the survey may provide the only source of pertinent information available relative to the population under study. The methodology used in collecting, analyzing, and interpreting survey data is of crucial importance if bias is to be avoided and correct statistical inference assured. The methodology employed by investigators in conducting seven consumer surveys pursuant to the marketing research phases of SM-19 is summarized in this section of the report. Results of five of these surveys have been published as Experiment Station publications and two are reported in an unpublished dissertation.

The aforementioned sources and the various techniques used by individual experiment stations are found in Table 1 (page 4). A summary of the techniques used is as follows:

<u>Techniques and methods</u>	<u>Number of surveys using this technique</u>
<u>Sampling techniques:</u>	
Random sample of the defined universe	3
Pre-tested schedule in a pilot study	2
<u>Survey techniques:</u>	
Personal interviews	5
Mail questionnaires	1
Telephone interviews	1
<u>Schedule format:</u>	
Direct and indirect questions	5
Direct questions only	2
Color photographs	2
<u>Types of indirect questions used:</u>	
Projective role situations	4
Picture frustration	2
Disguised direct interview	1
Open-end questions	1

Table 1. Sampling and Questionnaire Procedures used in SM-19 Household Surveys

Technique or procedure	State Experiment Station Studies*						
	Alabama circular 131	Alabama circular 139	Alabama circular 144	Georgia bulletins N.S. 64 N.S. 97	Louisiana bulletins 557, 565	Texas mail survey (unpublished)	Texas mail survey (unpublished)
Number of households interviewed	55	529	47	973	588	271	200
Random sample of the defined universe		<u>1/</u>		<u>2/</u>	X	X	X
Schedule pre-tested in pilot study				X	X		
<u>Survey technique:</u>							
Personal interview	X	X	X	X	X		
Mail questionnaire						X	
Telephone questionnaire							X
<u>Schedule format:</u>							
Direct questions only			X				X
Direct and indirect questions	X	X		X	X	X	
Color photographs used	X			X			
<u>Types of indirect questions:</u>							
Projective role situations	X			X	X	X	
Picture frustration				X	X		
Disguised direct interview	X						
Open-end questions				X			
Scale-type situations				X			

*Studies are identified by the resultant research publication (s).

1/ Blocks were selected at random, households were not.

2/ Households were required to satisfy eligibility requirements to be included in the study.

Methods of Sample Selection

The definitions used in delineating populations to be studied and the methods of selecting samples for the seven surveys are outlined below:

1. One study defined the universe to be hourly wage earners in a selected mill town. A list of all households comprising the universe was obtained and a random sample selected systematically from the list.
2. The membership lists of a professional women's club in two cities comprised the universe of one study. A random sample of members was drawn for inclusion in the study.
3. Another study included 529 households in 5 selected cities. An area sampling technique was used whereby block segments were drawn at random. The first 10 occupied dwellings in each segment made up the sample.
4. A systematic list of all households within the city limits of each of the four survey cities was used to draw a probability cluster sample. There were three adjacent addresses in each cluster.
5. The sample was randomly drawn from households listed in the city directory of each of the three cities surveyed. Sample elements were drawn in clusters of five.
6. One survey used mail questionnaires as part of an exploratory procedure for a consumer panel study. Questionnaires were mailed to 608 households that had been randomly obtained from the city directories of four cities. After three mailings, a total of 271 respondents returned usable questionnaires.
7. A survey of Dallas, Texas, households was conducted by telephone interviews. The sample was selected from Coles Criss-Cross Directory of

Dallas. A systematic sampling technique was used in selecting individual household addresses. The first household was selected at random and the additional households chosen at regular intervals (every 8th address listed).

Call Back Attempts

The procedure of three SM-19 surveys specified that three attempts would be made to contact the household without replacing it with an alternate. In another survey four attempts (three callbacks) were made to contact the household before it was replaced. The two smallest studies of 55 households and 47 households did not attempt callbacks while the mail questionnaire study sent three mailings to households that did not respond to original or second mailings, and nonresponsive households were not replaced.

Methods of Pretesting Questionnaires

Some effort was made to pretest questionnaires prior to the initiation of the field surveys. The pretests were informal and small scale in all except two of the studies. These two formal pilot studies were conducted with 80 questionnaires completed in one test and 100 questionnaires in a second.

Interviewing Techniques

Personnel. Although all household studies except the mail questionnaire and telephone interviews used personal interviews to obtain information, the personnel used to conduct the surveys differed. Examples are these:

1. In two of the smaller studies of narrowly defined populations, interviews were conducted by State Experiment Station personnel.

2. In four of the studies interviews were conducted by local women in each of the survey cities. The interviewers had been trained by State Experiment Station personnel.

3. A professional interviewing firm was engaged to conduct the telephone interviews.

Types of questions. The household questionnaires generally contained both direct and indirect questions. Only two surveys relied exclusively on direct questions. One of these was the telephone survey. The other was a study that used these three separate questionnaires: (1) a relatively unstructured questionnaire dealing with meal selection and preparation, (2) a one-week diary type report on meats purchased and served and time spent in selection and preparation, and (3) a decision-making scale that measured the homemaker's familiarity with various factors associated with meat purchase decisions.

Projective role situations. This is a method whereby the respondent is confronted with a simulated situation and the response is construed to be indicative of the action the respondent feels likely to be taken in this situation and why he thinks this action would result. SM-19 investigators have used this technique to obtain indications of the prestige associated with various meats and the reasons why a particular meat is preferred for a given situation. An example of the projective role format used by these investigators is found in Appendix I.

This technique was employed in three studies in conjunction with personal interviews and in the mail questionnaire survey.

Picture frustration techniques. This technique presents a series of cartoon sketches to the respondent. The respondent's reaction to the situation presented is obtained by requiring the respondent to give an answer by filling a blank "balloon" in the series of cartoon drawings. Investigators at two State Experiment Stations used this technique to record the respondent's indicated choices in assumed situations. An example of this technique is found in Appendix II.

Other questionnaire techniques. One study used disguised-direct techniques with a highly structured agree-disagree format relative to the factors underlying the housewives' meat-buying decisions. This technique attempts to phrase questions or to structure the interview so respondents do not feel personally involved when confronted with the questions. Two State Experiment Stations used color photographs of beef to obtain indications of respondents' meat preferences. Another Experiment Station used open-end questions to obtain consumer preference information.

Methods of Analyzing Data

Statistical tables were used in all the household studies to describe the demographic characteristics and consumer preferences of the sample families. Socioeconomic variables were used to analyze data in five studies. The socioeconomic variables most frequently analyzed were:

<u>Socioeconomic variable</u>	<u>Number of surveys using this technique</u>
Family income.	5
Race	3
Education of husband or head of household.	3

<u>Socioeconomic variable</u> (contin.)	<u>Number of surveys</u> <u>using this technique</u> (contin.)
Occupation of husband, head of household, or principal wage earner.	3
Size of family.	2
Age of housewife.	2
Education of housewife.	2
Occupation of housewife	2
Level-of-living (socioeconomic) score	2

Family income. These data were generally grouped into low, medium, and high categories and subsequently analyzed. Class limits assigned the income groups were not uniform from state to state and are given in Table 2, (page 10). In addition to the data found in Table 2, one analysis grouped income into six classes and not into low, medium, and high categories. This study also contained analyses based on per capita income.

Education. One State Experiment Station made analyses based on education of head of household, while two used education of male head (or husband) and education of housewife in analyzing data. The following classifications were used:

<u>Education of head of household and housewife</u>	<u>Education of head of household and housewife</u>	<u>Education of head of household</u>
No formal education	Elementary	Grade school
1-4 grade	High school	High school
5-8 grade	College	College
9-11 grade	No wife (husband in house)	No male head
High school graduate	No response, don't know	
Some schooling after high school		

Table 2. Class Limits Assigned to Income Groups in Various Studies and Number of Studies using Specified Income Levels as Class Limits

Income group and limits	Number of studies using limits	Income group and limits	Number of studies using limits	Income group and limits	Number of studies using limits
Low:		Medium:		High:	
Under \$3,000	2	\$3,000-4,999	1	\$5,000 and above	1
Under \$4,000	2	\$3,000-5,999	1	\$6,000 and above	2
Under \$5,000	2	\$4,000-5,999	1	\$8,000 and above	1
		\$4,000-7,999	1	\$10,000 and above	2
		\$5,000-9,999	2		

Occupation. Occupational classifications were used for analytical purposes by several states. Classifications were diverse and are listed in Table 3 (page 12).

Age of housewife and size of family. One Experiment Station used both age of housewife and age of family in analyzing household data. One Experiment Station used age of housewife, and a third Station used size of family (number of children in family). Classifications used are indicated below:

<u>Age of housewife</u>		<u>Size of family</u>	
<u>Years</u>	<u>Years</u>	<u>Number in family</u>	<u>Number of children in family</u>
Under 30	Up to 35	1	None
30 - 49	36 - 50	2	1 - 2
50 - 69	51 - 65	3 - 4	3 or more
70 and over	Over 65	Over 6	

Level-of-living score. Two Experiment Stations developed a level-of-living (or socioeconomic) score for use as an analytical device. The score was developed by weighting the various consumer durable goods, consumer nondurable goods, and services available for consumption by households. Items comprising the score and methods of weighting differed somewhat between the two Experiment Stations. On one scale, households could attain a score ranging from 0 to 20 and on the other 0 to 24. An example of one of these devices is found in Appendix III.

Other socioeconomic variables. Other socioeconomic variables used in single instances by one State Experiment Station were:

Dietary meat allowances	Meal cost per capita
Home background of housewife	Newspaper reading habits
Housewives' participation in outside activities	Radio and television ownership
Magazine reading habits	

Table 3. Occupational Classifications of Husband^{1/} and Wife Used in Analyses of Data

Occupational Classification	Number of studies using this classification for husband	Number of studies using this classification for housewife
Professional and executive	1	1
Professional, self-employed and managerial . . .	1	1
Professional	1	0
White collar	1	1
Clerical and sales	1	1
Clerical	1	0
Skilled	2	1
Skilled and semi skilled	1	1
Service	2	1
Domestic and janitorial.	1	1
Unskilled.	2	2
Housewife.	0	1
Welfare and retirement	1	1
Unemployed	3	22/
Part-time	1	1
No male head	2	0
No female head	0	1
Other	1	1
No answer.	0	1

^{1/} Referred to in some studies as male head, in others as a principal wage earner.

^{2/} In one study this included all housewives not employed outside the home.

Statistical significance tests. Investigators at three Experiment Stations used statistical significance tests in analyzing household data. In these analyses, one state used analysis of variance and chi-square, another only chi-square, and a third t-tests.

CONSUMER PANEL STUDIES

Consumer panel research inherently involves the securing of data two or more times from the same respondent. The survey and panel techniques are similar in many respects, with the major difference being the number of contacts between the research agency and the respondent. In addition, the panel technique presents several problems in research that further differentiate it from the survey approach viz.,

1. The respondent must cooperate not once, but at least twice. The requirement of more cooperation from respondents gives rise to serious questions concerning the representativeness of cooperative respondents.
2. The presence of conditioning effects. Repetitive participation in the panel may result in altered attitudes or behavior in regard to the question under study.

Consumer panel studies have been conducted by four State Experiment Stations as contributing projects to SM-19. The consumer panel members were families who agreed to cooperate with Experiment Stations by consuming the beef products for a given period under conditions approaching normal household consumption. Panel members furnished data by rating various product characteristics of each type of beef tested. State Experiment Stations conducting panel tests, beef products tested, and other pertinent data are given in Table 4 (page 14).

Table 4. State Experiment Stations Conducting Consumer Panel Tests, Size of Sample, Products Tested, Length of Test Period, and Type of Rating Scale Used

State Experiment Station Studies*					
Procedure	Alabama Preliminary Studies (Unpublished)	Georgia (Unpublished)	Louisiana Bulletin 596	Louisiana Bulletin 597	Texas (Unpublished)
Sample size (no. of families):					
Beginning test	25	43	38	122	300
Completing test	25	36	38	110	289
Products tested	Ground beef and boneless rib steaks	Freeze-dried beef in portion cuts	Frozen pre-fabricated beef cuts	Ground beef	Ground beef
Length of test period	4 weeks - ground beef 2 weeks - boneless steak	1-3 months	12 weeks	5 weeks	5 weeks
Type of rating scale	7 point hedonic scale (structured)	9 point hedonic scale (unstructured)	5 point hedonic scale (structured)	9 point hedonic scale (unstructured)	9 point hedonic scale (unstructured)

*Studies are identified by the resultant research publication(s).

Methods of Sample Selection

Sampling procedures concomitant to selection of families to comprise the consumer panels did not differ appreciably from the procedures used in selecting families for the household surveys. The procedures used by the individual State Experiment Stations were:

Alabama. The panel was composed of a sample of families residing in a moderate income housing development. The sample of families was not randomly selected.

Georgia. The panel was made up of selected households from two small Georgia cities. Random methods were not followed in selecting sample.

Louisiana. (1) Frozen prefabricated beef cuts study - Areas of a selected city were stratified by race and income. The panel was composed of white families with an annual income of at least \$7,000. A table of random numbers was used to select a sample of streets from areas of the city populated by the strata under study. Ten families were selected from each area. More than 200 families were interviewed to select the 38 families ultimately comprising the panel. Panel families were required to purchase 90 pounds of beef at a cost of \$75 and to have freezer space sufficient to store this quantity of meat. (2) Ground beef study - A random sample of streets in the city chosen for the study was selected. A list of all residences on sample streets was obtained and a sample of 20 per cent of the households on each street selected via a table of random numbers. The maximum number of residences permitted from a single sample street was 10. A similar procedure was used to obtain five alter-

nates for each address included in the primary sample. Both Louisiana studies used Cole's Directory, Baton Rouge, Louisiana 1963 to obtain listings of streets and residences.

Texas. Ground beef study - Dallas and Houston were chosen as cities from which to select the consumer panel. A multistage area probability sampling technique was used in selecting households for the panel. Large scale maps of both cities were divided into squares. In each city 10 of these squares were chosen at random. One small square was chosen at random from each of the 10 larger squares. A list of all households in the smaller squares was obtained. Subsequently, 15 of the households located in each of these squares was designated as sample households; thus, a total of 150 households was used in each city. In addition, two alternate households were designated as replacements if needed for each household included in the original sample.

Cole's Directory, Dallas, Texas 1961 was used to obtain a listing of Dallas households, and the Houston City Directory served the same function in the Houston sample.

Initial interviews. In each of the studies, sample households were contacted and attempts made to obtain relevant data on family attitudes of the product to be tested and socioeconomic data. Direct questions only were used in each of the questionnaires. Station personnel conducted the initial interviews at two of the participating Experiment Stations. Another Experiment Station obtained this information by means of a mail questionnaire and still another had a professional interviewing service conduct initial interviews.

Follow-up interviews in one instance (the Louisiana Frozen Prefabricated Beef Cuts Study) were conducted upon the completion of panel tests to get the respondents' opinion of the test products.

Product Handling Procedures

The panel research conducted by SM-19 investigators involved problems that were partly logistical since the product was required to be fabricated in the form desired for the test, and thereafter stored until delivered to panel households according to a pre-arranged schedule. In such projects, research design and procedures for handling the test product must be clearly defined. Households must receive clear instructions on storing the product in the home prior to testing, time of testing the product, methods of preparing the product for testing, methods of testing the product, and how to record their reactions to the product.

Fabrication procedures. Fabrication procedures followed by individual states conducting panel tests are as follows:

Alabama. Ground beef and rib steaks were prepared at the Experiment Station meats laboratory by Experiment Station personnel.

Georgia. The test product, freeze-dehydrated beef servings, was obtained from a commercial meat packing firm. Before distributing the test product to panel households, the beef was repackaged in vapor proof freezer type bags and the air exhausted through a vacuum system before resealing the packages. This was deemed necessary to remove the processor's name from the packages before delivering the beef to the family.

Louisiana. (Frozen prefabricated beef cuts study) - Carcasses from animals of known history, grading U.S. Choice and Standard, weighing from

500 to 700 pounds were fabricated to boneless round, sirloin, short loin, rib, chuck, and brisket cuts. These whole cuts were further fabricated to portion size steaks and family size roasts, retaining the identity of the cut and location within the cut. All cuts were packaged and the packages were labeled according to four suggested cooking methods: broiling steak, swiss steak, oven roast, and pot roast. Each family received a total of 24 packages, three from each of the Choice and Standard grades for each of the four cooking methods.

Louisiana. (Ground beef for varying fat composition study) - Ground beef of three different fat levels - 15, 25, and 35 per cent was prepared by a commercial meat packer, under direction of personnel from the Experiment Station. The ground beef was fabricated from utility grade beef chuck, and suet from Good and Choice grade carcasses. The 15 per cent fat level was obtained without the addition of trim fat, the 25 per cent fat level by the addition of approximately 12 pounds of suet per 100 pounds of ground chuck, and the 35 per cent fat level by the addition of approximately 21 pounds of suet per 100 pounds of ground chuck. Fat levels were ascertained during the final grinding and mixing operations by a rapid method of fat determination utilizing the Babcock fat testing principle. The fat content was adjusted to within plus or minus 1 per cent of the desired levels by this method. One-half of each formulation was made into patties - four per pound, The remainder was packaged as bulk ground beef. Each panel household received five packages of patties and five packages of bulk ground beef. Each household received one pack-

age of each of the three fat level mixtures and in addition, two randomly selected replicas of two of the three fat levels, making the total of five packages.

Texas. The ground beef tested was composed of lean cow beef blended by a commercial meat company with high quality fat from fed beef. Four lean-fat mixtures were prepared. By ether extraction, the mixtures contained 16, 20, 25, and 30 per cent fat, with fat being the only variable. The panel tests were conducted during a 5 week period. Ground beef containing 20 per cent fat was tested twice by the panel. This type was tested by all panel households in the first week and tested again by approximately two-thirds of the households in the fifth or final week.

Product delivery procedures. Immediately after fabricating the product, all Experiment Stations conducting consumer panel tests froze the test product and stored it in freezers until delivered to individual households.

Two Experiment Stations delivered test products to panel households each week during the period of the study.

One Experiment Station delivered the first test product to one-half of the cooperating families at a cooking-school demonstration. The other half received the samples delivered to their home by local field agents. Written directions were identical for all samples with respect to preparations and reporting.

Another Experiment Station delivered test products one time only - this being at the beginning of the study and instructions were left to panel households to consume a particular product in a specific week.

Two of the Experiment Stations sold the products to panel households at a reduced price, while the other two states conducting panel studies made the test products available to the households at no cost.

Product rating procedures. Hedonic scales were used by all states engaged in this work to record the reactions of members of the consumer panel toward the product. Although all states made use of hedonic scales, the type of scale used varied in that some were more complicated and more highly structured than others. One type of hedonic scale that was used is illustrated in Appendix IV.

One Experiment Station asked housewives to rate the product on a five point hedonic scale. The scale was structured in that each point was described. The descriptive terms were: liked very much, liked slightly, neither liked nor disliked, disliked slightly, and disliked very much. In Louisiana, (ground beef for varying fat composition study) a nine point unstructured hedonic scale was used and cooking as well as taste characteristics of the product were rated. The characteristics rated were: color before cooking, shrinkage, general cooking qualities, juiciness, flavor, and general acceptability.

Another Experiment Station had a seven point hedonic scale in which facial expressions were utilized to provide the respondent a visual concept of the degree of satisfaction associated with a particular rating. Respondents were asked to rate the product for flavor, juiciness, and tenderness characteristics. In addition, one scale was used to obtain an overall rating.

An unstructured 9 point hedonic scale was used by one Experiment Station and each family member over 12 years of age was instructed to rate the product. Characteristics rated were: tenderness, flavor, juiciness, texture, fatty taste, and overall taste and odor.

Still another Experiment Station used a nine point unstructured hedonic scale to rate both cooking and taste characteristics of the product. Housewives were asked to rate the product for the following cooking characteristics: raw color, cooking aroma, shrinkage, cooked color, and general cooking qualities. Each member of the household over 16 years of age was asked to rate taste characteristics. These characteristics were: flavor, tenderness, fatty taste, juiciness, and general liking.

How rating forms were returned to Experiment Stations. Two Experiment Stations had field enumerators pick up the completed rating forms when the next week's test product was delivered to the households.

The other two Experiment Stations instructed panel families to mail completed rating forms to the Experiment Station.

Methods of Analyzing Data

Methods of analyzing consumer panel data varied considerably from state to state and study to study. These methods are outlined below:

Alabama. The tests were designed as paired comparisons and analysis was based upon a comparison of the consumer preference rating of the test products with those of the control products. Analysis according to socioeconomic variables was not undertaken.

Georgia. Family acceptance of a new market form for beef was described according to scales such as socioeconomic and homemaker role. These scales and descriptive terms concerned with familiarity of beef cuts, information sources about new foods, and factors determining foods purchased were employed to study the mean palatability scores and probable purchase of the product if it were available in retail stores.

Louisiana. (Frozen prefabricated beef cuts study) - Data were analyzed to determine the effect of grade upon mean rating received by the particular beef cut and also the influence of cooking method on the rating of a particular cut within a grade. Chi-square tests were used to determine the statistical significance of the differences between ratings.

Louisiana. (Ground beef for varying fat composition study) - The influence of socioeconomic variables upon the mean rating of each type of ground beef was analyzed. Variables used in this analysis were family income, education of housewife, education of husband, age of housewife, and age of husband. Analysis of variance was used to analyze the statistical significance of the observed differences.

Texas. Comparisons were made of the mean ratings of the test products according to various cooking and taste characteristics. Mean ratings between the two cities were also compared. Mean ratings of those who said they would buy the product if it were available in stores were compared to mean ratings of people who said they would not buy the product. Mean ratings of the various family members were compared, and the relationship of family income on mean ratings was analyzed. Observed differences were analyzed for statistical significance via t-tests.

RETAIL STORE SURVEYS

Surveys have been made of retail food stores or retail food serving establishments by three state Experiment Stations in conjunction with the Marketing Research Objectives of the regional project. States conducting these studies and number of firms surveyed were: Georgia - 185, Louisiana 8, and Texas 355 in two studies.

Population Studied and Method of Sample Selection

The initiation of a marketing research project necessitates a definition of the population to be studied. Populations of retail firms studied by SM-19 investigators and the methods of selecting samples within these populations are as follows:

Georgia. All eating establishments within or not more than one mile outside the city limits of three Georgia cities comprised the population. Hospitals, colleges, private clubs, and other institutions that served public customers were included in the study. Institutions providing meals to members only were not included in the study. Data were obtained from 185 establishments which comprised the defined population.

Louisiana. The population was composed of retail food stores that sold ground beef products in the city of Baton Rouge. A sample of eight stores was selected so that all economic and socioeconomic sections of the city would be represented in the sample.

Texas. (Institutional market for beef study) - Houston was selected as the city for study. A list of establishments serving food in the city was obtained from the Houston Health Department and these establishments were categorized as follows:

- a. Industrial plants
- b. Hospitals
- c. Private schools and colleges
- d. Restaurants, luncheonettes, drive-ins, and hamburger stands

A sample was drawn that included 50 per cent of the establishments in each of the groups.

Texas. (Ground beef study) - Retail food stores that were units of chain supermarkets operating five or more retail stores in the state comprised the population. Stores operating in the El Paso area were excluded from the sample because of travel considerations. Only those stores located in cities of 50,000 or more inhabitants were surveyed. The sample of 91 was selected by grouping all cities in the state (except El Paso) that had populations of 50,000 or more into three size groups - Group 1, 50,000, but less than 100,000; Group 2, 100,000, but less than 200,000; and Group 3, more than 200,000. All the cities in Group 3 were purposely selected as sample cities and a random sample chosen of cities in each of the other size groups. The number of stores sampled in each city size group was proportional to the combined population of the universe of cities. For example, the large cities accounted for 66 per cent of the population of all cities. Therefore, 66 per cent of the sample stores were selected from this group.

Interviewing Techniques

The Experiment Stations conducting studies of retail firms all relied on personal interviews with store managers or other store officials to obtain data. All states also used direct question techniques when conducting these interviews and 8 x 10 color slides of beef cuts were shown meat

buyers in the eating establishments sampled in the Texas institutional market for beef study. In all instances Experiment Station personnel conducted the interviews.

Objectives of the Studies and Methods of Analysis

The information sought by the surveys and methods of analyzing the data were not identical among the Experiment Stations. An outline of the survey objectives and methods of analyzing the survey data are as follows:

Georgia. The study was designed to determine the relative demand for various meats, and the selection criteria used by purchasers of beef for commercial and institutional food service establishments. When conducting the interviews, color photographs of rib cuts of USDA grades of Choice, Good, and Standard were used to obtain the preferences for amount of covering fat and the degree of marbling. The proprietors were asked to recall information about the quantities of meats purchased in the seven days preceding the interview. The following relationships were presented in the report. The influence of size of restaurant upon the quantity and type of meat purchased, influence of season on type of meat served, amount spent on meat and types of meat served at various meals, and average price of meals as related to types of meat served. In addition, various descriptive data were presented such as grades of beef purchased by the various restaurants, amount and form of meats and seafoods purchased by the food serving establishments, availability of freezer facilities of the sample firms, and similar data. These data were subjected to F and t-tests by least squares analysis.

Louisiana. Meat market managers of the sample stores were interviewed to obtain their estimates of fat content of ground beef products merchandised in their store. Samples of ground beef were obtained from the stores and subsequently chemical analyses were performed and fat, protein, and ash contents of the samples were determined. Estimates of the meat market managers were then compared to the chemically determined fat contents of the sample ground beef products.

Texas. (Institutional market for beef study) - The primary purpose of the study was to ascertain whether hotels, restaurants, and other commercial or institutional establishments prefer the same grades of beef as previous research indicated was preferred by most consumers (i.e., good and choice) or if these establishments considered higher grades more suitable. In addition to the major objective the study sought answers to the following questions:

1. How important is the market for beef among eating establishments?
2. From what supply channels is the beef obtained?
3. In what form is beef purchased?
4. What buying procedures are used?
5. To what extent are USDA meat grades used in ordering beef?
6. What amount of fat is preferred?
7. What methods are used for storing meat?
8. To what extent is frozen beef used?
9. Is ready-cut beef used by very many establishments?

Texas. (Ground beef study) - Meat market managers were interviewed and information obtained on their methods of estimating the fat content of ground beef products. Meat market managers were questioned concerning their attitude toward quality characteristics of ground beef and hamburger. They were also questioned concerning their opinions of consumer preferences for ground beef and hamburger. In addition information was obtained concerning the store's ground beef pricing policies. Samples of ground beef products were purchased and analyzed by Experiment Station personnel. Fat content of these samples was ascertained by the ether extract method. Following this, the fat contents as indicated by the ether extract were compared with the meat market managers' estimates of the fat contents of these same products. Other relationships studied were: the influence of the income clientele served by the store and ground beef and hamburger sales as a percentage of total sales.

APPENDIX I

EXAMPLE OF PROJECTIVE ROLE SITUATION TECHNIQUE USED BY SM-19 INVESTIGATORS

Now, we would like you to tell us what meats you think some homemakers would serve in various situations. After I read you the kind of meal each homemaker was planning, tell me what kind and cut of meat you think she decided to serve and how she cooked it.

Fred and Carol were having an important man guest for supper. What kind of meat do you think Carol would choose?

Kind of meat _____ Cut _____ Method of cooking _____

Ellen has a large family with several young children. She wants a main dish that the whole family will enjoy. What kind of meat do you think she would choose?

Kind of meat _____ Cut _____ Method of cooking _____

Barbara and her husband have invited a special woman guest for dinner. What kind of meat would she serve?

Kind of meat _____ Cut _____ Method of cooking _____

Dorothy is going to be busy all day. For the main meal she wants a cut of meat that won't take too long to prepare and will be easy.

Kind of meat _____ Cut _____ Method of cooking _____

Alice is planning the regular evening meal and needs something not too expensive.

Kind of meat _____ Cut _____ Method of cooking _____

What kind of meat would Anne cook for dinner on Sunday for her family?

Kind of meat _____ Cut _____ Method of cooking _____

Helen and her husband are having a couple over for supper. Helen wants something to impress them. What kind of meat will she serve?

Kind of meat _____ Cut _____ Method of cooking _____

SOURCE: Louisiana Experiment Station Bulletin 557, page 21.

APPENDIX II

EXAMPLE OF PICTURE FRUSTRATION TECHNIQUE USED BY SM-19 INVESTIGATORS









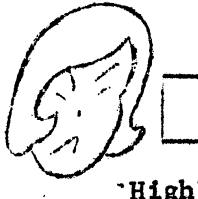
APPENDIX III

Example of Socioeconomic score used by SM-19 Investigators

1. Freezer	Home freezer	2
	Freezer locker	1
	No	0
2. Hot and cold water	Yes	2
	Water piped in	1
	No	0
3. Power washing machine	Yes	2
	No	0
4. Telephone	Yes	1
	No	0
5. Radio	Yes	1
	No	0
6. Television	Yes	2
	No	0
7. Newspaper	Daily	2
	Weekly	1
8. Auto and/or truck (one, 5 years old or newer)	two	2
	one or two (both old models)	1
	No	0
9. Own home	Yes	1
	No	0
10. Home improvements in past 5 years (if house was built in last 5 years give 2 points)	Yes	2
	No	0
11. Education of either head or principal earner	College graduate	3
	High school graduate	2
	Some schooling	1
	No	0
12. Participation of family members in organizations	All members 6 yrs. and over in 1 or more organizations other than church	2
	Some member in 1 or more organizations other than church	1
	In church organizations only or in no organization	0
13. Homemakers regular reading-newspapers and/or magazines	3 or more	2
	1 or 2	1
	None	0
Total		24

SOURCE: Georgia Agricultural Experiment Station Bulletin N.S. 64, page 30.

EXAMPLE OF HEDONIC SCALES USED BY SM-19 INVESTIGATORS

	<u>Ground Beef</u>	<u>Steak</u>
	<input type="checkbox"/>	<input type="checkbox"/>
	Highly Satisfactory	
	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>
	Highly Unsatisfactory	

MEAT ACCEPTANCE TEST
Project No. 579

Test factor: _____

Directions:

Please indicate your opinion of each test sample by marking the box beside the facial expression which most nearly indicates your reaction to the sample. (Check only one in each column.)

ACCEPTABLE METHODS OF PREPARATION
(Please check the method which you followed.)

For ground beef

- 1. Broiled hamburger steak _____
- 2. Hamburger on bun _____
- 3. Ground meat patties _____
(pan-fried)
- 4. Ground meat patties _____
(broiled)

For steaks

- 1. Broiled in oven _____
- 2. Pan-broiled _____
- 3. Pan-fried _____
- 4. Braised _____

Additional Comments _____

Name _____

Address _____

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