FOOD ACCEPTANCE AND PREFERENCE RESEARCH: AN ANNOTATED BIBLIOGRAPHY

U. S. Army Materiel Command
U. S. ARMY NATICK LABORATORIES
Natick, Massachusetts
FOOD ACCEPTANCE AND PREFERENCE RESEARCH
AN ANNOTATED BIBLIOGRAPHY

by

Barbara L. Bell
Naomi S. Oshinsky
Joel Wolfson

Pioneering Research Division
U. S. Army Natick Laboratories

1965

Technical Report NPT-5
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INTRODUCTION

The 293 items cited in this bibliography represent recent (1950 to 1964) contributions to the rapidly growing fields of food acceptance and preference research and related areas. Particular emphasis has been placed on the work of individuals associated with the former Food Acceptance Branch of the Armed Forces Food and Container Institute, in Chicago.

This bibliography is intended for the use of those persons engaged in government, consumer, or scholarly research programs in which the accurate sensory measurement of acceptance and preference values is the direct or indirect goal.

There are 173 annotated entries. Most of these are items published in the scientific and technical journals of relevant subject areas — food science and technology, psychology, and marketing research.

The other 120 entries are reports published by several of the branches of the U.S. Government. The titles of the reports are descriptive of their contents and they are not annotated. Although these publications are not generally available in public or university libraries, reprints if available may be obtained by writing to: Head, Acceptance Laboratory, Psychology Laboratories, Pioneering Research Division, U.S. Army Natick Laboratories, Natick, Massachusetts.

The Acceptance Laboratory plans to periodically update the bibliography to include those works which have appeared since the compilation was completed. Additions to this bibliography will be welcomed. Please send the annotated items to the above address.
The bibliography is divided into four major sections and sub-sections when necessary. Items are listed alphabetically by author within each subsection. A brief description of the type of item contained within each section is included before the section listings.

Cross referencing will be done only between major sections. Since the government reports are not listed by subject, relevant government publications will be listed before each major section.

Acknowledgement

The authors wish to thank the following former members of the staff of the Acceptance Branch at the QMFCI for their assistance:

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E.G. Schutz
<table>
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<td>Amer.J.Psychol.</td>
<td>American Journal of Psychology</td>
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<td>A.S.Q.C.</td>
<td>American Society for Quality Control</td>
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<td>ASTIA</td>
<td>Armed Services Technical Information Agency</td>
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<td>C.F.T.R.I.</td>
<td>Central Food Technological Research Institute</td>
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<td>Food Eng.</td>
<td>Food Engineering</td>
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<td>Food Technol.</td>
<td>Food Technology</td>
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<td>Int.J.Air Poll.</td>
<td>International Journal of Air Pollution</td>
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<td>J.appl.Psychol.</td>
<td>Journal of Applied Psychology</td>
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<td>J.comp.physiolog.Psychol.</td>
<td>Journal of Comparative and Physiological Psychology</td>
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<td>J.consult.Psychol.</td>
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<td>J.Food Sci.</td>
<td>Journal of Food Science</td>
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<td>J.Psychol.</td>
<td>Journal of Psychology</td>
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<td>MSG</td>
<td>Monosodium Glutamate</td>
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<tr>
<td>Percept.mot.Skills</td>
<td>Perceptual and Motor Skills</td>
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<tr>
<td>Psychol.Reports</td>
<td>Psychological Reports</td>
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<tr>
<td>P.T.C.</td>
<td>Phenythiocarbamide</td>
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<td>QM</td>
<td>Quartermaster</td>
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<td>QMC</td>
<td>Quartermaster Corps</td>
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<tr>
<td>Abbreviation</td>
<td>Description</td>
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<tr>
<td>QMFCI</td>
<td>Quartermaster Food and Container Institute</td>
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<td>QMRAD</td>
<td>Quartermaster Research and Development</td>
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<tr>
<td>QMFEA</td>
<td>Quartermaster Field Evaluation Agency</td>
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<tr>
<td>QMRE</td>
<td>Quartermaster Research and Engineering</td>
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<tr>
<td>RADC</td>
<td>Randolph Air Development Center</td>
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<td>WADC</td>
<td>Wright Air Development Center, Dayton, Ohio</td>
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I. SENSORY STUDIES

A. GENERAL

Studies concerned with the testing of sensory processes in general and the testing of specific senses other than taste and smell are of value because of the many similarities and contrasts among the sensory processes. It is also apparent that there are interrelationships among the senses which may affect the acceptance or preference for a particular food item. (See also: 198)

B. TASTE

1. Part 1 contains those studies which are concerned with the measurement of the sensitivity and thresholds of individuals for particular taste substances. Physiological and chemical as well as psychophysical studies are included.

2. Part 2 includes studies of flavor and the variables which enhance or diminish a particular flavor.

3. Part 3 contains those studies which discuss the psychological variables which influence taste. This part is related to section II-B in which studies which report the influence of variables on the acceptance or preference for a food item, not the taste of a particular flavor component of that item. (See also: 81, 82, 128, 178, 205, 185, 217, 221, 222, 234, 238, 252)

C. OLFACTION

This subsection includes studies on the sense of smell, especially as it relates to the tastes and preferences of different food items. (See also: 224, 242, 252)
I. SENSORY STUDIES

A. GENERAL


The concept "panel" is used in this paper in the specific sense which limits it to groups with special qualifications which are used for special purposes.


The present experiment was designed to check Goetel and Stone's work on odor thresholds and to determine if diurnal fluctuations also occur in taste and visual thresholds.


Part I: General introduction intended simply to orientate the reader to what is to follow.

Part II: A psychological approach to the problems of measurement; consideration of reliability and validity and their relevance to the broader problems of laboratory practice. (Vol. VII, No. 11, 649-651.)

Part IV: The psychophysical methods and laboratory practice. A synopsis of the methods and their functions. (Vol. VIII, No. 1, 17-20.)


Concerned mainly with certain methods which are commonly accepted as difference tests.


A general inquiry into the factors involved in sensory tests, by using review and discussion rather than exposition.

Bell, Oahinsky & Wolfson

This article discusses the development of a manual for the purpose of finding reliable tests to determine compliance either at the stage of the awarding of subsistence contracts or in checking compliance at time of delivery.


"Sensation is subjective. Nobody can touch or measure anything that is subjective. Sensation is unique for any particular person. It is dealt with by the psychologist."
B. TASTE

1. MEASUREMENT


Attempts to determine whether the general rule of ion effects holds for taste.


Three experiments carried out concerning the transmission of information about simple and compound solutions.


Because of the location of man's gustatory and olfactory receptors it is possible to sample both the food ingested and its aroma.


Explanation of mechanism of "electric taste".


Variations in taste sensitivity are associated with genetic variations controlling the amount and composition of the soluble enzyme system, tyrosine iodinase of the soluble enzyme system.


See item 12.

It is important to know what to reject as well as what to select.


Investigations show that deprivation of sleep does not affect any of the sensory functions except pain -- which is depressed.


The effects of hunger have great variability in the influence on the R.L.'s of taste and odor.


Concerns taste in general and taste blindness in particular.


Concludes that changes in thresholds relate to changes in sensory acuity and may in turn relate to sensations of hunger or satiety.


At moderate solution concentrations, the perceived intensities of the mixtures are significantly higher than the intensities of the pure solutions.


An investigation of taste interactions.
MACLEOD, S. 1952. A construction and attempted validation of sensory

An attempt to assess the validity of sweetness scales based on
fractional judgments of one-half.

MEYER, D.R. 1952. The stability of human gustatory sensitivity during
changes in time of food deprivation, J.comp.physiol.Psychol.,
Vol. XLV, No. 4, 373-376. 22.

Nine human subjects abstained from all foodstuffs for a period
of 34 hours, during which time successive determinations of sweet,
salt, and bitter thresholds were made at 3-hour intervals.

MITCHELL, J.W. 1956. Duration of sensitivity in trio taste testing,
Food Technol., Vol. X, No. 4, 201-203. 23.

With beer as the product and duo-trio as the method of testing,
it is shown that five tests can be run in a single session with-
out encountering loss of sensitivity.

PANGBORN, R.M. 1960. Taste interrelationships, Food Research,

Interrelationships among sucrose, citric acid, sodium chloride
and caffeine were determined.

SCHUTZ, E.G. 1954. Physiologic need and voluntary food intake -- A
QMF, seminar, Activities Report, Vol. VI, No. 1, 41-44. 25.

Summary of an experiment conducted at the Institute.

SCHUTZ, E.G. & F.J. PILGRIM. 1957. Sweetness of various compounds and

Sixteen compounds were rated on a subjective intensity scale for
sweetness at each of 5 concentrations.

SCHUTZ, E.G. & F.J. PILGRIM. 1957. Differential sensitivity in
gustation, J.exp.Psychol., Vol. LIV, No. 1, 41-48. 27.

This study was designed to determine the four basic taste
qualities at five levels of intensity.
B. TASTE

2. FLAVOR


Ten commercially processed precooked frozen meals, packed with and without MSG were submitted to a comparative preference study.


The changes caused by radiation are quite apparent to man's olfactory and gustatory senses.


Many studies have substantiated that MSG has a very definite effect on consumer preference for many foods.


Here flavor is defined as that complex of sensations resulting from the stimulation of the senses of taste, odor, feel and sometimes vision and audition.


Eight experienced judges of tested sensitivity were used to determine the possible enhancement of supraliminal sweetness and saltiness by subliminal concentrations of monosodium glutamate.


Results showed that 'Ac'cent' and 'Zest' greatly increased acuity to salt and no effect to sugar.

Chemical tests are by comparison to panel tests but gross predictors of flavor.


"Quality control can apply to almost anything that is manufactured, at least wherever it is possible to evaluate in terms of good and less good."


The potential of monosodium glutamate for use in improving the acceptability of military rations is discussed.


One of three objectives of this article is to gain acceptance of the idea that effective flavor quality control requires use of human observers.


MSG is not a condiment, it does not impart a flavor of its own but serves only to enhance the natural flavors of foods by increasing the sensitivity of the taste receptors.


Complexity has long been considered a desirable factor in the quality of most flavorsome or odorous products.

The flavor profile concepts and method, when properly practiced, have some value in the field of food acceptance.
B. TASTE

3. PSYCHOLOGY


A method is presented for analyzing all of the psychological properties of any food or beverage product.


Experiments are described which demonstrate the existence in normal individuals of diurnal variations in acuity of the sense of taste for sucrose.


Gustation, the act of tasting is most legitimately used when the topic is food not esthetics.


Investigates the "meanings" of terms used on hedonic rating scales.


a. Relationship between hunger and sweetness preferences of 11,456 consumers.

b. Taste thresholds under fasting and no fasting conditions.

The effect of red, green and yellow food coloring on the judged sweetness and flavor of aqueous and nectar solutions was tested by the method of paired comparison.


White wines were colored to simulate, sauterne (yellow), sherry (brown), rosé (pink), claret (red), and burgundy (purple).


Shows that correct identification of the sweeter sample within pairs was always more frequent in uncolored than in colored nectars.


The sensory experience aroused by sodium benzoate may be common among all persons, yet responses may be variable because the taste is unfamiliar and ambiguous so that the response is mediated in part in the central nervous system, where it is influenced to a large extent by attitudes and expectations.


Learning appears to be important in the taste qualities people report for various items.


Deals with low and high intensity sensory studies.

The taste reactions of different subjects (30 tested) to cane sugar and common salt differed with ears closed and ears open.


Explores the frequency of genetic traits among smokers and non-smokers affecting their ability to taste P.T.C.
C. Olfaction


The object of this study was to determine the effect of various storage techniques and materials on known concentrations of gases in air.


A technique for measuring odorous intensity is described.


The responses of the two nerves to odors presented to the nose were simultaneously displayed on a dual beam oscilloscope.


Includes a "Floor-Plan" of the Olfactory Laboratory.


Experiments show that the decrease in olfactory acuity appeared to depend upon ingestion of food because it failed to occur when meals had been omitted.


Changes in olfactory threshold values indicate changes in olfactory acuity.

Arbitrary limit of precision for this experiment is the ability to analyze three primary qualities in a compound with constant dependability by the judges.


Triangle tests are sensory testing at its best and are essential when the differences are near the threshold.


Appears that thresholds obtained by use of the Elsberg or blast-injection technique are not understandable in terms of molecular concentration.


Reports the results of measurements of olfactory intensity for a homologous series of aliphatic alcohols.


The odor-intensity of a substance is defined as the number of times that its normal odor-threshold concentration is enhanced by one just prior inspiration of the undiluted substance.


Odors which exist in the atmosphere differ from one another in the type of response they evoke in various individuals.
Archives of Industrial Health, Vol. XVII, No. 5, 537-541.

Proper evaluation of odor on the basis of its definition
requires both a measurement of odorant concentration and a
measurement of human response.

Symposium on olfaction, Proceedings of the Scientific Section

1. Erroneous literature prompted this study to eliminate falla-
cious and unverified data concerning olfaction.

2. The proverbial "man in the street" has little or no concern
for the physiological basis of the odor sense, but will avoid
unpleasant odors and will ring those cash registers which fur-
nish them with desirable odors.

3. Impairment of or distortion of the sense of smell may result
from conditions which affect the nasal passages, nasal nerve
endings, nerves or the portion of the brain in which the olfactory
sense is located.

4. Olfactometry is concerned with the measurement of the
strength of olfactory sensations or obtaining a number to
represent odor intensity.

STOLL, N. January, 1954. Special problems in odor perception,
Drug and Cosmetic Industry.

The odor perception mechanism is one of those unsolved problems
which puzzle men of science.

TRACHTMAN, L.E. 1961. Sense of smell, Purdue Research Foundation,
Vol. VII, No. 5.

The "messages" sent by the environment are written in many
languages and the organism has developed a variety of receptor
organs of fantastic sensitivity and complexity with which it
can receive and interpret these messages.

The electrical activity in this study has been recorded peripherally and centrally from nerves identified as olfactory and trigeminal.


Efferent nervous activity in the nasal area of the rabbit was recorded on the central side of cut branches of the ethmoidal nerve.
II. FOOD ACCEPTANCE AND PREFERENCE RESEARCH

A. THEORY

Articles and studies describing the basic frames of reference, assumptions, theories and problems of food acceptance and preference research are included.

B. CONTRIBUTING VARIABLES

This sub-section includes studies reporting the influence of specific variables on the judged acceptance or preference for a food item. (See also studies listed below for the following topics:

- Attitude 148, 183, 239, 248
- Combination of foods 176, 232
- Drugs 204
- Environment
  - Altitude 266, 267, 268, 283
  - Background 237
  - Changing 187
  - Tropics 188, 189, 235
- Innovation 247
- Personality 275
- Radiation 29, 207, 240, 257, 258
- Repetition - monotony 243, 244, 245, 259, 283

C. METHODOLOGY

Included in this sub-section are studies of experimental design and procedure as well as possible statistical analyses to be used with food acceptance and preference tests. (See also: 4, 6, 23, 41, 143, 196, 198, 208, 231, 254, 269).

D. PANEL SELECTION

This sub-section contains studies of the problem of valid selection of a panel to reliably judge food items. (See also: 1, 14, 253).
I. APPLICATIONS TO SPECIFIC POPULATIONS

1. Military - The specific problems of military feeding have been considered in the studies included herein. In addition, almost all of the government reports are applicable to this topic.

2. Consumer - This part contains studies which apply acceptance and preference research principles to the particular problems of consumer behavior. (See also: 229, 251, 274).
II. FOOD ACCEPTANCE AND PREFERENCE RESEARCH

A. THEORY


Attention is drawn to selected problems faced by food acceptance techniques and the study of food acceptance by man.


Reviews ways in which psychological knowledge has contributed, or potentially could contribute, to food sciences.


Here are the results of special questionnaires devised to establish the effect of certain variables on those who use data obtained from food consumption surveys.

KRAMER, A. 1959. Glossary of some terms used in the sensory (panel) evaluation of foods and beverages, Food Technol., Vol. XIII, No. 12, 733-736.  76.

Defines 85 terms concentrating on those frequently used in food testing.


PERIAM, D.R. 1964. Sensory testing at the Quartermaster Food and Container Institute, Laboratory Practice, Vol. XIII, No. 7, 605-609.  78.

Food acceptance programme is discussed to fully explain working methods of the laboratory.

Highlights the importance of the acceptance division.


Preference not only predicts the average amount of food consumed in certain situations but also the proportion of persons taking or "accepting" a serving of the food.
B. CONTRIBUTING VARIABLES


The effect of omitting pepper from certain foods is explored.


Mixtures of grapefruit and lemon drinks with different proportions in each were tested for preference then verbal descriptions were matched with samples.


The more a person was told about the purpose of unfamiliar foods, the more he tended to rate them alike.


Concludes that most foods decline in consumption and preference with repetitive eating.


Accessory foods (jelly or catsup) can be evaluated without an appropriate carrier, i.e. bread or hamburger, at least as effectively as with the carrier.


Generally, food habits in individuals or in a culture tend to be resistant to change. But the general principles of learning can still be expected to apply.

Small differences in similar foods, gross differences in checking general overall preferences, and group attitudes toward foods are now being quantitatively pegged using the hedonic scale adaptation.


There are personal or individual attitudes and beliefs, and there are group and cultural attitudes that help determine whether a person will accept a food.


Three-fourths of the variation in percentage of enlisted military personnel who take the foods at the serving table is predictable from knowledge of food preferences, the fillingness of the food, and the amount of 2 major nutrients, the food contains.


It is recognized that taste discrimination can be influenced by a person's knowledge of what he is tasting and his expectations about it.


Questionnaires consisting of 54 foods were administered to 305 mail enlisted personnel attending service training schools at the Great Lakes Naval Training Center, Illinois.
Food monotony, overtly expressed as lowered consumption and preference, is primarily a function of repetition.

Acceptance of unusual foods could be maximized if they are introduced with a specific functional application and in a form in which their "unusual" qualities are least apparent.
C. METHODOLOGY


6-panel members scored 82 cooked beef samples for tenderness and counted the number of chews to ready a ½ inch cube for swallowing.


A scale designed to measure personality dimensions involving attitudes toward food.


Deals with the use of factor analysis in food testing.


Preference for a food combination differs from the sum or weighted average of the individual component preferences.


Here contrast and convergence effects in sample sequence are shown to be independent of position effect.


Flavor differences in vegetables cooked in boiling water and by steaming methods have been studied by the use of a paired comparison method.

Replication of the triangle test preference method, outlining possible biases including cultural effects.


Statistical designs for taste tests.


The basic principles of factor analysis are discussed.


Confirmed that preference ratings for poor quality food will be lower when preceded by a good quality food than when preceded by another poor-quality item. (contrast effects).


Uses of trained panels to determine presence of chemicals in foods.


Discusses responses from Duo-Trio taste difference tests.

Over-selection of the first or second sample in a paired comparison test is a time error.


Panelists were able to distinguish differences in stored fish measured as different in amounts of salt extractable protein.


A system of evaluating the storage stability of foods was developed and empirically validated by the wealth of useful information it has provided.


Developed for dried milk, procedure employs special panel selected for skill in detecting small differences between two samples.


The background of this scale method is not a new discovery and contains the whole history of the development of rating scales.


Three tests designed for the measurement of sensory differences are described, and a method for statistical analysis of the results is suggested.

Concerned with development of sensory evaluation methods only, and not with the physical and chemical aspects.


Questionnaires were used to obtain information on more than 400 foods, and on certain background characteristics of the respondents such as age and region of origin.


Rating scale and paired comparison methods were tested for comparability in detecting differences in preference.


The fact that toughness and tenderness lie on the same continuum of meaning and sensory discrimination is not clearly established, though taken for granted.


Discusses possible errors when rating scale technique is used and methodological considerations to avoid error.


Objectives of psychophysiological research.


Development of a new paired comparison method.

Food Acceptance and Preference Research
Comparisons in relation to preference testing.

Method of analysis is proposed for paired comparisons which is exact for small samples and involves only extremely simple computations. The experimental design is well known, the statistical analysis is new.

Describes a method of locating experimentally the subjective origin of a stimulus.

This design is concerned with detection and adequate description of the relationships of results to factors under study, despite the disturbing influence of other factors.
D. PANEL SELECTION

"Judgmental fatigue" does not affect rater reliability or bias when the subjects report food preference self-ratings.

A scheme for choosing a few individuals whose preferences for given objects are most representative of those larger groups of individuals is proposed.

Development and application of procedures for the sensory assessment of eating quality; includes descriptive rating scales and results.

Describes the screening method in selecting panel members for 2-sample test (1 standard and 1 experimental sample).

A method for choosing a panel of judges for a sensory experiment to insure that the individual judges and the panel as a whole can detect differences at any given probability level is described.

Gives additional tables for a method of choosing a panel of judges for a sensory experiment to insure that the individual judges can detect differences at any given probability.
SAWYER, F.M., H. STONE, H. ABPLANALP & G.F. STEWART. 1962. Repeat-
ability estimates in panel selection, J. Food Sci., Vol. XXVII,
No. 4, 386-393.

Concludes that repeatability estimates can predict the pro-
portion of judges whose sensitivity meets established specifi-
cations.
E. APPLICATION TO SPECIFIC POPULATION

1. MILITARY


Planning meals which give optimum satisfaction thereby contributing to morale and efficiency is ultimate goal in food preference studies of military personnel.


This paper employs questionnaire data to establish functions from which predictions are made of the preferred frequency with which foods are served on meals planned by the QM for military personnel.


Appetite appeal is discussed as a key problem in the development of adequate foods and containers for the armed forces.


Meat as a highly valued difficult to process military ration is discussed.


The "hedonic scale" was developed at QMF&CI in 1949 and has become the standard instrument for use by QMC in lab and field tests of acceptability.


Studies have shown that preferences for specific foods often depend on certain personal characteristics of the consumer.

Discusses problems in designing foods and containers for the armed forces.


Dr. Pedersen presents some of the key difficulties associated with the procurement, transportation, storage, etc., of class I perishable subsistence items and the resources used in solving them.


Food acceptance is not a study of food but of what people do about food.


Discusses details of food acceptance determinations and describes foods in terms of sensory properties.


Nine messes, each which fed 1 company of about 200 men were served orange juice of good quality, as the test food. All men were basic trainees.


The most common, the most efficient and probably the most reliable method of accessing acceptability is to measure the verbally expressed affective responses of a sample of consumers, and from these measurements establish the positions of various food items on some continuum from which acceptance behavior may be inferred.

Gives a general picture of background of U.S. Army QMC program of developing new feeding systems of the Armed Forces.


Ground, river and swamp waters from different areas were used along with distilled water to reconstitute dehydrated army rations and were found to be acceptable under the conditions of the experiment.


Soldiers attitudes toward the army (whether favorable or unfavorable) reflects in their preference ratings of foods.


The end products sought here are quick-serve food items of great acceptability, considerable storage life and high field utility.


Concerns the armed forces feeding problems.


A feeding system has been conceived which will provide a good tasting ration in any climate while escaping some of supply limitations of our present rations which become critically important in the tactical conditions envisioned.

Research in problems of feeding armed service personnel results in improved civilian feeding.


Soldiers' relative preferences for more than 300 army recipes were established through five surveys conducted by the QM Corps during a two-year period.


Reports on "Food preferences of men in the U.S. Armed Forces".
E. APPLICATION TO SPECIFIC POPULATION

2. CONSUMER


This paper seeks to call attention to economic implications of preference measurements of data of a form commonly collected in consumer studies, implications which apparently merit further empirical and theoretical examination.

BENSON, P.H. September 5-6, 1957. Optimizing product acceptability through marginal preference analysis, Quality Control and the Consumer Conference, Rutgers, the State University.

Several problems facing the consumer are discussed.


Concerns problems in consumer research.


Tries to determine "When does a good egg cease to be good?" and "How bad must a bad egg be before it won't be eaten?"


People do not always buy to get the most from their money.
KENNEDY, B.M. 1952. Food preferences of pre-army age California boys,

A study of attitudes toward 258 foods and typical preferred menus was carried out on 144 boys, 17 to 19 years of age, in northern California.


Sociology and anthropology are extensive, complex subjects with many possible ways of drawing connections between them and demand analysis.


"The uses of readiness-to-buy measures outlined here suggest that a shift in emphasis in the use of predisposition measures is needed."


Shows that survey results can be correct for a total sample, even when many individuals have not reported accurately. Also that seemingly correct results sometimes conceal a bias which leads to false conclusions.
III. ANIMAL STUDIES

Studies on animals include those on taste, smell, food acceptance and preference and the influence of external variables on food-related behavior. Differences and similarities between humans and animals are worthy of consideration and are necessary in the planning for future research.
III. ANIMAL STUDIES


An investigation to determine rejection thresholds of the blowfly.


When receptors located on the tarsi of blowfly are stimulated by solutions of certain sugars the insect responds by extending its proboscis and, when permitted, by drinking.


The response of the blowfly phormia regina has been studied by means of a specially designed olfactometer.


"This study was designed to supply information which might serve to correlate some of the existing knowledge relative to feeding preferences, food selection, and nutritive requirements".


The salt preference of the adrenalectomized rat, as well as the normal rat, is under multifactor control.

Summarizes the first of a series of studies on the motivation of sugar preference, and was designed to investigate some of the factors producing glucose preference under normal dietary conditions and under an experimentally induced need for glucose.


This study was designed to elucidate the differences in taste sensitivity in various strains of mice, and to study the relationship between taste sensitivity and color of the fur.


Calls attention to fact that a reaction to a flavor was modified by the simultaneously offered alternatives.


Study of gustatory sense in the rat.


After two days starvation, rats prefer high fat foods no matter what their pre-starvation diet had been.


Concerns the effectiveness of taste stimulation in mammals.
IV. GOVERNMENT REPORTS

The studies in this section are divided into sub-sections based on the type of publication. Items are arranged alphabetically by author within each sub-section. The items are not arranged by topic but include items relevant to other major sections as indicated in the prefaces to these sections.

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2. Contract Reports 214-251
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IV. GOVERNMENT REPORTS

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MC COY, J.L. July, 1963. Soldiers' attitudes toward foods in a tropical environment, Part 1: The nature of the tropical environment and soldiers' reactions toward operational rations, 3-63. 188.


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BURT, T.B. December, 1957. A field test of the ration, individual, combat, meal type, FEA, T-50 56002-F. 255.


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8 - 10 October 1956 at WADC, Wright-Patterson Air Force Base, Dayton, Ohio.

13 - 14 February 1957 at QM&CI, Chicago, Illinois.

21 - 22 May 1957 at QM&EC, Natick, Massachusetts.

7 - 8 May 1958 at Camp LeJuene, North Carolina.


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