



AgEcon SEARCH
RESEARCH IN AGRICULTURAL & APPLIED ECONOMICS

The World's Largest Open Access Agricultural & Applied Economics Digital Library

This document is discoverable and free to researchers across the globe due to the work of AgEcon Search.

Help ensure our sustainability.

Give to AgEcon Search

AgEcon Search

<http://ageconsearch.umn.edu>

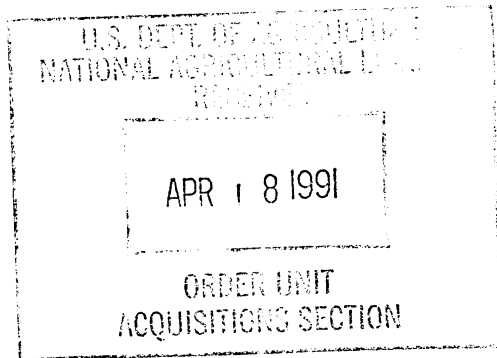
aesearch@umn.edu

*Papers downloaded from **AgEcon Search** may be used for non-commercial purposes and personal study only. No other use, including posting to another Internet site, is permitted without permission from the copyright owner (not AgEcon Search), or as allowed under the provisions of Fair Use, U.S. Copyright Act, Title 17 U.S.C.*

FOOD DEMAND ANALYSIS
Implications for Future Consumption

Edited by
Oral Capps, Jr. and Benjamin Senauer

Sponsored by
The S-165 Southern Regional Research Committee
and
The Farm Foundation



Department of Agricultural Economics
Virginia Polytechnic Institute and State University
Blacksburg, Virginia 24061

August 1986

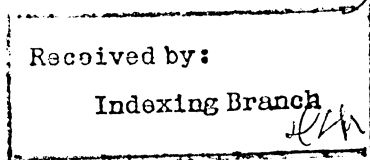


Table of Contents

| | |
|---|-----|
| Preface | vii |
| Acknowledgments | xii |
| MARKET DEMAND FUNCTIONS | |
| S.R. Johnson, Richard D. Green, Zuhair A. Hassan, and A.N. Safyurtlu | 1 |
| Individual Consumer Demand | 2 |
| Market Demand | 5 |
| Empirical Results for Market Demand Systems | 13 |
| Structural Dynamics | 18 |
| Scaling and Translating | 22 |
| Conclusions | 25 |
| GLOBAL BEHAVIOR OF DEMAND ELASTICITIES FOR FOOD: IMPLICATIONS FOR DEMAND PROJECTIONS | |
| Michael K. Wohlgenant | 35 |
| Methodology | 36 |
| Data and Estimation Procedure | 39 |
| Econometric Results | 41 |
| Implications for Demand Projections | 44 |
| FOOD EXPENDITURE PATTERNS: EVIDENCE FROM U.S. HOUSEHOLD DATA | |
| Chung L. Huang and Robert Raunikaar | 49 |
| The Linear Expenditure Model | 51 |
| The Data and Estimation Procedure | 53 |
| The Statistical Results | 54 |
| Implication and Application | 61 |
| Conclusion | 63 |
| PROJECTING AGGREGATE FOOD EXPENDITURES TO THE YEAR 2000 | |
| Kuo S. Huang and Richard C. Haidacher | 67 |
| Abstract | 67 |
| Model Specifications | 69 |
| Empirical Estimation Results | 71 |
| Applications of the Estimated Model | 75 |
| Summary | 83 |
| DISCUSSION | |
| Joseph Havlicek, Jr. | 87 |

| | |
|--|-----|
| IMPLICATIONS OF FACTORS AFFECTING FOOD CONSUMPTION | |
| Robert Raunikar and Chung L. Huang | 91 |
| Historical Perspective | 92 |
| Changing Explanatory Factors | 93 |
| Spatial and Temporal Effects | 98 |
| Implications and Conclusions | 102 |
| IS THE STRUCTURE OF THE DEMAND FOR FOOD CHANGING? | |
| IMPLICATIONS FOR PROJECTIONS | |
| Reuben C. Buse | 105 |
| The Model | 107 |
| The Analytical Model | 110 |
| The Results | 113 |
| Summary and Conclusions | 124 |
| THE EFFECTS OF HOUSEHOLD SIZE AND COMPOSITION | |
| ON THE DEMAND FOR FOOD | |
| David W. Price | 131 |
| Procedures | 132 |
| Changes in the Age-Sex Equivalent Food Population | |
| Over Time and Projections to the Year 2000 | 142 |
| ROLE OF INTEGRATED DECISION THEORY IN CONSIDERING | |
| FUTURE FOOD CONSUMPTION PATTERNS OF THE ELDERLY | |
| Dorothy Z. Price | 149 |
| Decision Making Theories | 149 |
| Nutrition and the Elderly | 151 |
| Discussion of Empirical Study | 153 |
| Implications for the Future | 157 |
| EFFECTS OF INCREASING ELDERLY POPULATION | |
| ON FUTURE FOOD DEMAND AND CONSUMPTION | |
| Ronald A. Schrimper | 163 |
| Changes in Economic Well Being of the Elderly | 164 |
| Saving and Aggregate Expenditure Behavior | 164 |
| Expenditure Survey Evidence | 165 |
| Effects of Household Characteristics on Expenditure Patterns | 167 |
| Away-From-Home Food Expenditures | 168 |
| At-Home Food Expenditures | 170 |
| Evaluation of Elderly Diets | 172 |
| Implications on Future Demand for Food | 173 |
| COMMENTS: FOOD DEMAND ANALYSIS: | |
| IMPLICATIONS FOR FUTURE CONSUMPTION | |
| Lester H. Myers | 177 |
| General Factors Affecting Demand | 178 |
| Structure Change | 179 |
| Age Distribution and Family Size Changes | 180 |
| Impacts of an Increasing Proportion of Elderly People | 181 |
| Summary | 183 |

| | |
|--|-----|
| POPULATION SCALE, COMPOSITION, AND INCOME EFFECTS ON PER CAPITA AND AGGREGATE BEEF CONSUMPTION: A TEMPORAL AND SPATIAL ASSESSMENT | |
| Patricia K. Guseman and Stephen G. Sapp | 185 |
| Procedures | 186 |
| Projections of U. S. Beef Consumption | 196 |
| Projections of Beef Consumption by Demographic Market Area | 199 |
| Summary and Conclusions | 208 |
| ORANGE AND GRAPEFRUIT JUICE DEMAND FORECASTS | |
| Mark G. Brown and Jong-Ying Lee | 215 |
| Demand Factors | 216 |
| Demand Specifications | 220 |
| Data and Variables | 222 |
| Results | 223 |
| Summary | 227 |
| ANALYSIS OF CONVENIENCE AND NONCONVENIENCE FOOD EXPENDITURES BY U. S. HOUSEHOLDS WITH PROJECTIONS TO THE YEAR 2000 | |
| Oral Capps, Jr. and Joanne M. Pearson | 233 |
| Definitions of Convenience and Nonconvenience Foods | 234 |
| Model Development | 234 |
| Data and Procedures | 239 |
| Empirical Results | 241 |
| Projections | 246 |
| A SYSTEMATIC ANALYSIS OF HOUSEHOLD FOOD CONSUMPTION BEHAVIOR WITH SPECIFIC EMPHASIS ON PREDICTING AGGREGATE FOOD EXPENDITURES | |
| James C. O. Nyankori | 251 |
| Theoretical Basis: Household Resource Allocation Behavior | 251 |
| Data | 253 |
| Empirical Model | 257 |
| Empirical Results | 261 |
| IMPLICATIONS FOR FOOD DEMAND OF CHANGES IN COMPETITIVE STATE WITHIN MARKETING CHANNELS | |
| Barry W. Bobst | 269 |
| Disequilibrium Market Theory | 269 |
| Implications for Demand Analysis | 271 |
| Realism of Market Disequilibrium | 272 |
| Application of PAMEQ to Beef Markets | 274 |
| Implications for Demand Analysis in 2000 | 278 |
| FOOD DEMAND ANALYSIS (DISCUSSION) | |
| Joseph C. Purcell | 281 |
| Comments on Papers | 281 |
| Concluding Comment | 283 |
| INDEX | 285 |

Food Demand Analysis

(Discussion)

Joseph C. Purcell

This discussion addresses the papers as received rather than in the order in which they are listed in the program. A final comment addresses the over-all food demand analysis work.

Comment on Papers

Barry Bobst develops an interesting theoretical exposition on disequilibrium pricing with application to the fresh beef trade. The theory simply states that there may be lags in adjustment to changes in either supply or demand -- i.e., rigidity in retail prices or resistance to change. This is, of course, a long standing concept in retail pricing, but research to establish or measure disequilibrium is of more recent vintage.

As might be anticipated, Bobst's empirical application to fresh beef was inconclusive. It is well known that retail prices are in fact administered prices. Moreover, data available to analysts are highly aggregated and at best are a central tendency of numerous individual transactions. Empirical research that is successful in validation of the hypothesis of disequilibrium pricing adds very little to the body of knowledge concerning market or consumer behavior. Especially in cases where there is no evidence of collusion, it simply reveals imperfect market knowledge and/or imperfect judgment on the part of numerous individuals with respect to market clearing prices. Disequilibrium pricing does present a problem with respect to demand analysis. The next question is: "What can we do about it?" Bobst offers a few approaches, but there doesn't appear to be any simple solution.

Brown and Lee presented a rather straight forward conventional analysis of demand for several different forms of citrus juice with market projections to future target years. These projections are useful to the industry, policy makers, and others, assuming the projections are reasonably on target.

Joseph C. Purcell is professor and Department Head, Georgia Experiment Station, University of Georgia College of Agriculture.

Changes in per capita food consumption in the United States during the remainder of this century are largely a matter of substitution among foods -- that is, no change in the total. Substitution processes occur over a period of time and then stabilize or sometimes change direction. With population growth rates in the range of 0.6 to 0.7%, the annual growth rate in demand for orange juice (2.8 to 3.3%) appears to be somewhat on the optimistic side. The final tally will depend on trends in income distribution, which I will address in my concluding comment.

Capps presented a rather straight forward, conventional analysis focused on convenience incorporated in foods. There is a legitimate need for information on the demand for services or preparation incorporated into foods. However, there is a vast difference in convenience associated with foods and the quantity of service or preparation associated with the food. On this score, Capps' adopted classification scheme was rather meaningless and useless.

Examples abound, and I will allude to only a few. Fresh milk, natural cheese, fresh fruit, etc. require little or no household preparation yet in the Capps scheme they are classified as nonconvenience foods. On the other hand self-rising flour, biscuit and cake mixes, etc. require substantial household preparation prior to consumption but are classified as convenience foods.

Consumers pay a higher price for a quantity of food energy in baked bread than in flour and the other ingredients incorporated in bread. The difference represents a demand for services. The same rationale applies to live chicken, iced or frozen chicken, chicken parts, or a tub of Kentucky fried chicken. Meaningful demand analysis should clearly differentiate between the raw product, and the incorporated preparation or service. Food preparation, like most other economic activities, is more efficient under a system of specialization.

Ms. Guseman and Mr. Sapp's temporal and spatial assessment of the United States beef market is somewhat of an update of the first work I did -- excluding thesis work -- while on the Bureau of Agricultural Economics (now Economic Research Service) payroll. Spatial and temporal dimensions of markets are of continuing interest to producers, fabricators, and distributors. Beef consumption emanates from complex interactions of supply and demand forces characterized by lags of varying lengths, cycles, seasonality, etc. The beef industry carries a large inventory which can be partially liquidated and converted to consumption in a short-time. However, the first impact of a perceived increase in demand is a reduction in consumption as inventories are increased and slaughter reduced. Consumption and prices have to be interpreted rather carefully with respect to supply-demand analysis.

Nyankari developed an interesting paper around the concept of the marginal propensity to spend on food. However, as a food industry analyst, I would have substantial reservations with respect to the

projections. Information presented in the tables is neither very clear nor adequately documented.

Concluding Comment

Deficiencies in food demand analysis lie largely in the data base. The theory is rather straight forward, but available estimates of the cogent parameters are unreliable. During the past two decades or so, the profession has built a skyscraper of estimating techniques on a data sand bed. There is nothing wrong with improving estimating techniques, but this effort has been over-emphasized compared with the effort to acquire solid data. Readily available data are characterized as inaccurate, inadequate or inappropriate. A few examples illustrate this allegation.

Aggregate personal income or disposable income, divided by population, is the most commonly used demand shifter in time series analysis. However, without a companion estimate of income distribution, per capita income as a demand shifter is at best inadequate and may even be misleading. Consumer income or the lack thereof acts as a constraint on the exercise of need and preference. At the higher levels of income, income is no longer a constraint on food purchases.

As per capita real income increased from about 1940 to about 1979, there was a simultaneous redistribution of income toward the low end of the scale. However, since 1979, income is being redistributed toward the high end of the income scale. This redistribution is simply a ramification of the long standing collinearity problem in time series data, or more seriously a bias from omission of relevant variables. The important thing in food demand analysis is not the change in gross income but rather who receives it.

Cross-sectional data on individual consuming units provide a better foundation for estimating relationships between food demand and income. There are, however, serious reservations with respect to the accuracy of recall data. Whether or not there are offsetting errors in recall data is a matter of judgment. Continuous reporting panels, where food purchases are recorded as they occur, are perhaps more accurate. Such data are, however, rather limited in scope, and/or rather expensive.

In that total food disappearance on a per capita basis is rather constant in the United States, major emphasis is focused on the composition of foodstuffs or more specifically the substitution processes. Also, as the proportion of food moving through institutions and food service outlets increases, the composition of this part of the food disappearance is of increasing importance. Food service outlets are perhaps more price responsive than are individual consumers. Also, the problem of price rigidity -- i.e. disequilibrium pricing -- is more critical in food service outlets than through retail stores.

On a positive note, retail scanning data offer substantial potential for food demand analysis, particularly in those markets where consumer profile data (income, age composition, etc.) can be associated with food purchases. To my knowledge there is no comparable data base for food moving through institutions and food service outlets. My recommendation for the next decade is to place more emphasis on accurate, adequate, and appropriate data for food demand analysis.

Reference

- MacNeary, Tony. 1984. Electronics and Food Distribution: New Opportunities in Market Research. Paper presented at the 25th Annual Meeting of the Food Distribution Research Society. Atlanta, Ga., USA.