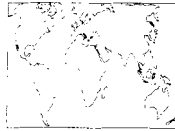


**NEC
63**



**Research
Committee on
Commodity
Promotion**

Annotated Bibliography of Generic Commodity Promotion Research (Revised)

by
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Published by

**Department of Agricultural Economics
Cornell University Agricultural Experiment Station
New York State College of Agriculture and Life Sciences
A Statutory College of the State University
Cornell University, Ithaca, New York 14853**

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PREFACE

The number and size of commodity promotion programs have increased dramatically during the last 10 years. Along with this increase has been an increase in the number of research reports on the economics of generic commodity advertising. Depending on how one describes a commodity, it is easy to identify over 50 commodities that are produced and marketed in the United States that collect funds from producers, and in some cases from processors and importers, for the sole purpose of conducting research and developing advertising and promotion programs. During the most recent 12 months it is possible to account for \$700 million being invested in commodity promotion and research programs in the hope of strengthening demand. Although a great deal of economic research has been completed on brand advertising, only a modest amount has been conducted on generic advertising. While brand advertising is expected to increase the sales of the firm that owns the brand, generic advertising is a collective action that is expected to expand the sales of a commodity group or product category. Although there are similarities in the manner in which both types of advertising influence sales, their purposes are different, and it is believed that the process through which generic advertising affects sales might be different than for branded advertising.

Almost all of the commodity promotion activity is producer-funded. Producer check-offs are authorized, and in many cases mandated, by state and federal legislation. One source estimates that in 1986 there were 312 programs that operated under the authority of either federal or state legislation. The survey reported in the Lenz article covered 116 promotion organizations.

The members of NEC-63, Research Committee on Commodity Promotion, provided encouragement for us to complete this work and many members contributed through comments and by providing us copies of publications. Therefore, this publication is being sponsored by NEC-63 and will be included as an item in their list of sponsored works. Financial support and support in kind for the work was provided by the Office of Research of the New York State College of Agriculture and Life Sciences, federal research funds, the state of New York, and the New York State Milk Promotion Board.

The authors thank the many contributors and reviewers of this publication. Special thanks go to Henry Kinnucan, Ron Ward, David Jones, and Richard Wittink for suggestions, to Janelle Tauer for her careful editing, and to Shirley Arcangeli for her work in typing and formatting the final copy.

I will appreciate receiving any comments concerning the accuracy of the annotations and the completeness of the bibliography. Since we plan to continually update our data file of publications, I will especially appreciate receiving copies of new or additional relevant articles.

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WHAT IS NEC-63?

NEC-63 was established by the northeast directors of the Agricultural Experiment Stations in 1985. Committee members are individuals from academia, government, and industry who are interested in, or doing research on, the economics of commodity advertising and promotion programs. The goal of NEC-63 is to improve the quality of research by its members and improve understanding by others.

The committee operates through an executive committee that establishes policy and develops program activities. Research and education are conducted independently or collaboratively by members of the committee. The committee itself does not sponsor or conduct research. Rather, it provides a forum for discussion and sharing of information and ideas on research methods and results. The committee facilitates discussion and dissemination of knowledge through semiannual meetings, sponsored conferences, and publications.

COMMITTEE OBJECTIVES

The specific objectives of NEC-63 are:

- To foster communication among research personnel involved in the study and evaluation of generic commodity promotion programs.
- To facilitate communication between practitioners and analysts.
- To organize and conduct periodic workshops and symposia for both technical and lay audiences.
- To prepare and disseminate written material that will provide information for improved decision making and more effective commodity promotion programs.

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INTRODUCTION

Since commodity promotion programs began in the 1920s, U.S. producers of almost every commodity (milk, beef, pork, citrus, raisins, cotton, etc.) have joined together to organize and fund research and promotion programs. New commodities continue to be added. By 1990, over three-quarters of a billion dollars was being spent on commodity promotion by producers and processors of over 50 commodities. More than \$200 million was also invested by the federal government in cooperative ventures with commodity producers to promote their products abroad (Lenz et al., 1991).¹

The authority for funding is an important factor in determining the amount of money that can be collected from farmers or processors in order to conduct a commodity research and promotion program. Many of the early commodity promotion organizations were voluntary in nature, with interested farmers agreeing on the amount each would contribute, usually based on the volume marketed. During the 1930s, however, some states passed enabling legislation making contributions mandatory. These programs were referred to as state-mandated promotion check-off programs. Also in the 1930s federal market order legislation began authorizing use of market order funds to promote a few fruit and vegetable commodities.

Overall, the number of voluntary and state-mandated promotion programs continued to grow rapidly, particularly during the 1960s and 1970s. However, many of these programs had one major shortcoming, namely the "free rider" problem. This occurred since any positive effect of the promotion program provides benefits to all producers of a commodity while only a portion actually contributed to the promotion organization. To combat this problem, commodity groups in the 1970s began requesting federal legislation to allow mandatory non-refundable assessments. While legislation was passed granting assessment authority for some commodities, a policy was established that farmers could get their contribution refunded upon request. Only in 1983 did Congress grant enabling legislation for a mandatory nonrefundable check-off program, beginning with the dairy industry. Today the funding authority for commodity promotion organizations may be federally or state-mandated, based on producer/processor check-offs or voluntary contributions, come from other sources, or come from a combination of sources.

While commodity promotion expenditures continue to grow, evaluation of program effectiveness can be spotty or nonexistent, depending on the program and particularly its budget and objectives. Existing means of evaluation often focus on tracking consumer awareness of advertising rather than econometric analysis relating consumption to the promotion campaign. While many econometric studies have been conducted, as evidenced by the bulk of the annotations contained herein, even these rarely go on to determine the benefit to the actual producers from their investment in commodity promotion.

The purpose of this publication is to present relevant scholarly work directly related to generic commodity advertising and promotion research and evaluation in an easy-to-use form for further study and research. Sources for the annotations include professional journals, books, university staff and

¹This refers to items listed in the Annotated Bibliography.

working papers, dissertations, and unpublished reports by commodity consulting firms.

The items annotated in this publication reflect the wide variety of commodity promotion programs either past or present, ranging from seafood to tea to rice to lettuce. Citrus and dairy are most widely represented due to the duration and extent of their advertising efforts and the evaluation components of their respective promotion programs. A few articles that focus on advertising effectiveness or evaluation for nonagricultural products (i.e., eyeglasses, cigarettes) are included, as are some strictly methodological studies. While the majority of items are U.S.-based, there are also numerous annotations on generic promotion and evaluation in Canada and the U.K., as well as studies of U.S. promotions in Europe that are funded in part by the Foreign Agricultural Service (FAS).

All in all, generic promotion, advertising, and evaluation are examined using a broad range of quantitative methods and data sources. The table of contents provides an alphabetical and chronological listing of all the articles included; author and title are provided. A complete citation for each article is presented at the beginning of each annotation.

A listing of the authors, indexed according to commodity and/or subject matter, is provided in the last few pages of this report. Articles are indexed according to the following categories: advertising theory; alcohol and tobacco; citrus; dairy; econometric methods; export promotion; fibers; fruits and nuts; general commodity promotion; grains and oilseeds; meats, poultry, seafood, and eggs; promotion in countries other than the U.S.; promotion other than media advertising; and vegetables.

This bibliography was produced in order to create a base for continuing economic research on how generic advertising influences consumer behavior. It is hoped that this will be of interest to and help professionals in academia, government, and industry who are interested in and involved in the economic analysis of commodity promotion programs.

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Ackoff, R.L. and J.R. Emshoff. 1975. *Advertising Research at Anheuser-Busch, Inc. (1963-1968)*. Sloan Management Review, 16(2):1-15. During the period 1962-64, a number of experiments were conducted by varying the levels of advertising for Budweiser beer while leaving the levels of sales calls and point-of-purchase (POP) promotions constant. Budweiser sales actually increased 5% when advertising was decreased 25%, indicating advertising levels had reached supersaturation. Even in areas where advertising was eliminated entirely, sales remained constant for 18 months. Advertising pulsing both by season and by media was also tried. In comparison to 1962, by 1968 sales volume had doubled, market share had increased 5 percentage points, and overall advertising expenditures had been reduced 58%. Billboard advertising was eliminated entirely.

Adelaja, A.O., R.G. Brumfield, and K. Linniger. 1990. *Product Differentiation and State Promotion of Farm Produce: An Analysis of the Jersey Fresh Tomato*. New Jersey Agricultural Experiment Station Publication D-02260-90. Data from a 1988 supermarket survey were used to determine the effectiveness of the "Jersey Fresh" generic advertising campaign in creating product differentiation among fresh tomatoes. Using a double log functional form, the demand equations were estimated with seemingly unrelated regression techniques. The results indicated that "Jersey Fresh" tomatoes had a more inelastic demand and a higher income elasticity than other types of fresh tomatoes. It was also determined that the tomatoes' origin was important to consumers and "Jersey Fresh" tomatoes were less substitutable than other types. Own-price elasticity for "Jersey Fresh" tomatoes was estimated as -0.1351 (-0.2012 for other types of tomatoes) and income elasticity was estimated as 0.2450 (0.2023 for other types of tomatoes).

Albion, M. and P. Ferris. 1981. *The Advertising Controversy: Evidence on the Economic Effects of Advertising*. Auburn House Publishing, Boston, MA. Chapters include "Advertising in the Marketing Framework," "Advertising in the Economics Framework," "Advertising and Market Power," "Advertising and the Economy," "Central Underlying Issues," "Determinates of Advertising Effectiveness," "The New Models," "Advertising and Prices," and "Summary and Conclusions." This book provides empirical evidence from a variety of studies to support, and in some cases refute, conventional advertising theory.

Albisu, L.M. and J.A. Dominguez. 1987. *Spanish Consumers' Behavior with Respect to Wine Advertising*. Acta Hortuculturae, 203(June):213-219. Personal interviews were conducted among 204 residents of Zaragoza, Spain to determine which media are most effective for generic wine promotion. Cluster analysis differentiated three broad consumer types: those equally swayed by television, radio, and newspapers; those not influenced by newspapers; and those who were not influenced by any of the media. Logit analysis was used to estimate consumer reactions toward a campaign to increase wine consumption. Not surprisingly,

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heavier drinkers viewed such a campaign favorably, while nondrinkers had more negative reactions.

Amuah, A.K. 1985. *Advertising Butter and Margarine in Canada*. M.S. Thesis. University of Guelph. Generic butter promotion in Canada was examined to determine if it increased total demand for edible fats and oils, using data from 1973 through 1982. Advertising, price, and income elasticities with respect to demand for fats and oils were derived, as well as own and cross elasticities for prices, advertising, and total expenditures. Overall, it was estimated that net revenues would rise if butter advertising was discontinued, due to the cost of the program. Decreasing the price of butter was suggested as a more effective method of increasing sales.

Armbruster, W.J. 1983. *Advertising Farm Commodities*. North Central Regional Research Publication 287. N.C. Project 117. Monograph 14, pp. 165-177. College of Agriculture and Life Science, Research Division, University of Wisconsin, Madison, WI. This article summarizes various generic advertising concepts and issues. Topics covered include the growth in generic advertising, referendum voting procedures, effects of small voter turnout, evaluation of generic promotion, generic promotion's effect on sales of other commodities, problems arising from an automatic check-off program, political aspects of generic promotion, and differences between what is best for commodity promotion groups versus individual producers and consumers.

Armbruster, W.J. and L.H. Myers, eds. 1985. *Seminar Proceedings on Research on Effectiveness of Agricultural Commodity Promotion*. Farm Foundation, Oak Brook, IL. The proceedings are divided into five subject areas. The first includes an overview of generic agricultural promotion; the second focuses on evaluating program effectiveness and foreign market development; the third includes articles on information's effect on consumer preference; the fourth examines analytic methods of evaluating program effectiveness; and the fifth looks forward to new methods of research, data needs, generic promotion policy implications, and ways to improve industry cooperation. Overall, this publication is an excellent review of generic promotion research through early 1985.

Armbruster, W.J. and R.L. Wills, eds. 1988. *Generic Agricultural Commodity Advertising and Promotion*. A.E. Extension Paper 88-3. Department of Agricultural Economics, Cornell University, Ithaca, NY. Written by members of the Northeast Regional Committee on Commodity Promotion Programs (NEC-63), this series of six pamphlets contains the following titles: "Its Role in Marketing," "Program Funding, Structure, and Characteristics," "Public Policy Issues," "Economics and Impacts," "International Programs," and "Program Evaluation." A comprehensive overview of generic commodity promotion, these pamphlets provide information on international, federal, and state promotion programs, and cover sources of funding, effects of promotion on overall supply and demand, marketing strategies, and program-effectiveness evaluation techniques.

Arnold, S.J., T.H. Oum, B. Pazderka, and D.W. Snetsinger. 1987. *Advertising Quality in Sales Response Models*. *Journal of Marketing Research*, 24(1):106-113. A partial-adjustment sales-response model was estimated, including an advertising variable. Results indicated that a 1% improvement in advertising quality was 20 times more effective in increasing sales than a 1% increase in advertising spending. The difficulty lies in measuring a 1% improvement in quality and uncertainty about the final cost.

Australian Wool Corporation and the Bureau of Agricultural Economics. 1987. *Returns from Wool Promotion in the United States*. Occasional Paper 100. Australian Government Publishing Service, Canberra, Australia. 33 pp. The effect of increased wool promotion on U.S. demand and the consequent effects on production levels and market prices in Australia were estimated, including short- and long-run elasticities for price, income, and wool promotion. The benefit-cost ratio was estimated to be \$1.94, or two dollars returned for each dollar spent on promotion.

Ball, K. and J. Dewbre. 1989. *An Analysis of the Returns to Generic Advertising of Beef, Lamb and Pork*. Discussion Paper 89.4. Australian Bureau of Agricultural and Resource Economics, Canberra, Australia. 37 pp. Based on data from 1977-88, a demand equation using "seemingly unrelated regression" was estimated to determine the effects of generic advertising on Australian red meat consumption. Estimated advertising elasticities were 0.037, 0.029, and 0.01 for beef, pork, and lamb, respectively. Own-price elasticities were estimated at -0.953, -1.599, and -1.131 for beef, pork, and lamb, respectively. Simulations found that beef demand responded the most to an increase in generic advertising, with pork having a slightly lower response and lamb responding the least. Overall, beef advertising was determined to be most effective in actually increasing demand.

Ball, R.J. and R. Agarwala. 1969. *An Econometric Analysis of the Effects of Generic Advertising on the Demand for Tea in the U.K.* *British Journal of Marketing*, 4(Winter):202-217. The effect of generic promotion on demand for tea in the U.K. was estimated using data from 1958-68. Results indicated that to maintain tea consumption at the 1968 level would require doubling generic advertising expenditures by 1973, assuming a constant rate of decline in consumption. The optimal advertising pattern was estimated to be steady quarterly expenditures without "pulsing." It was concluded that coffee had directly substituted for tea in all households, with no correlation of class differences or occupational changes to declining tea consumption.

Ball, R.J. and J. McGee. 1970. *An Econometric Analysis of the Demand for Milk*. Economic Models, Ltd. (Unpublished). Using quarterly data from 1953-70, models were built using multiple-regression techniques to examine the impact of generic advertising on full-priced sales of milk in the England and Wales market. Price, income, and advertising elasticities were calculated (-0.194, 0.111, and 0.023) and optimal advertising budgets were constructed. Overall, generic advertising was found to affect milk sales volume in a positive way, and some modest expansion of advertising budgets from suboptimal levels was argued.

Balmer, T.M. 1986. *An Analysis of Pennsylvania Dairy Farmers' Opinions and Voting Behavior Concerning Producer-Funded Milk Advertising Programs*. Bulletin 860. Agricultural Experiment Station, College of Agriculture, The Pennsylvania State University. 35 pp. A 1983 survey of Pennsylvania dairy farmers was conducted to determine if voting behavior on the 1982 Pennsylvania Milk Marketing Referendum (which failed) could be explained by socio-demographic or attitudinal factors. "Yes" voters were found to be more favorably disposed to generic promotion and government involvement in general than "no" voters, who indicated that further deductions would be a financial burden and that advertising was not a farmer's responsibility. Attitudes and beliefs were found to have more effect overall on voting behavior than socio-demographic variables.

Baltagi, B.H. and D. Levin. 1986. *Estimating Dynamic Demand for Cigarettes Using Panel Data: The Effects of Bootlegging, Taxation and Advertising Reconsidered*. *The Review of Economics and Statistics*, 68(1):148-155. Pooled data from 46 states from 1963-80 were used to estimate the effects of changes in advertising and taxation on cigarette demand. An error component model was used with the Hausman-Taylor estimation procedure and also with the Zellner-Geisel estimation technique. Own-price elasticity was estimated as -0.22, with a neighboring state's price elasticity of 0.08, indicating some "bootlegging" across state lines. Advertising was found to have an insignificant effect on consumption. It was also estimated that raising real prices 10% in all states would decrease consumption by only 1.4% overall. State consumption would vary, however, depending on their tax structure and their neighbors'. Based on the low price elasticity, federal revenues could potentially be raised by increasing cigarette taxes.

Bass, F.M. and D.G. Clarke. 1972. *Testing Distributed Lag Models of Advertising Effect*. *Journal of Marketing Research*, 9(3):298-308. To study the effects of advertising, six distributed-lag equations using sales data were estimated to determine which best fit evidence to theory. Predictive testing was performed on each equation based on the "nesting" design of the configuration. Using this approach, only two models were not rejected. The conclusion was that the Koyck model (and geometric decay) does not represent the shape of the lag distribution of the advertising function. For monthly data, a non-monotonic lag structure may be a more accurate indicator of distribution shape than the Koyck model, which is more restrictive.

Belleza, E.T. 1991. *Advertising of Farm Commodities in a Regulated Market: The Case of Dairy Products in Canada*. Ph.D. Dissertation. Auburn University. A 29-equation system with block-recursive submodels was estimated for fluid milk, butter, cheese, nonfat dry milk, and other manufactured dairy products using quarterly data from 1973-88. Within each submodel three-stage least squares was used to estimate demand, price, and supply relationships. Advertising elasticities were estimated as 0.03, 0.07, 0.09 for fluid milk, butter, and cheese, respectively. Price elasticities were estimated as -0.17, -0.60, -0.30, and -0.57 for fluid milk, butter, cheese, and nonfat dry milk, respectively. Farm-level supply response and cross-commodity substitution were also included in the analysis.

Benham, L. 1972. *The Effect of Advertising on the Price of Eyeglasses*. *Journal of Law and Economics*, 15(2):337-352. To determine advertising's effect on prices, a comparison was made of eyeglass and eye examination prices in states allowing advertising for these items versus prices in states with no advertising. In 1963, three-quarters of the states had some prohibitions against eyeglass or eye examination advertising. It was determined that those in states with no advertising paid \$7.48 more for eyeglasses than those in other states. It was also demonstrated that the same quality was available from different types of retailers, again with little regard to price. Overall, it was concluded that the benefit to consumers from advertising offsets any increase in costs.

Blaylock, J.R. and W.N. Blisard. 1988. *Effects of Advertising on the Demand for Cheese*. Technical Bulletin 1752. USDA, ERS, Washington, DC. 33 pp. Using data from 1982-87, aggregate demand models were estimated to determine the effects of branded and generic advertising on at-home consumption of natural and processed cheese. Own-price elasticity for natural cheese was estimated to be -1.3, with income elasticity of 0.8 (own-price and income elasticities for

processed cheese were -0.8 and -0.05, respectively). It was found that generic advertising for natural cheese encourages more households to buy natural cheese, while generic advertising for processed cheese encourages households who already purchase processed cheese to purchase more. It was estimated that the increased generic advertising due to the Dairy and Tobacco Adjustment Act was responsible for increasing consumption of natural cheese by 10-22 million pounds and processed cheese by 66-126 million pounds between September 1984-June 1987.

Blaylock, J.R. and W.N. Blisard. 1990. *Effects of Advertising on the Demand for Cheese, January 1982-June 1989*. USDA, ERS Staff Report No. AGES 9055. Washington, DC. 24 pp. Using data from 1982-89, aggregate demand models were estimated to determine the effects of branded and generic advertising on at-home consumption of natural and processed cheese. Own-price elasticity for natural cheese was estimated to be -1.2, with income elasticity of 1.0 (own-price and income elasticities for processed cheese were -0.8 and 0.04, respectively). Using simulations, it was estimated that enactment of the Dairy and Tobacco Adjustment Act increased natural-cheese sales by 21 million pounds (0.4%) and increased processed-cheese sales by 193 million pounds (5.2%). Over the period September 1984-June 1989, this gain in sales was calculated to be 0.1 pound per advertising dollar for natural cheese and 0.9 pound per advertising dollar for processed cheese.

Blisard, W.N. and J.R. Blaylock. 1989. *Generic Promotion of Agricultural Products: Balancing Producers' and Consumers' Needs*. Agriculture Information Bulletin 565. USDA, ERS, Washington, DC. Federal and state promotion programs are in effect for 80 commodities, and 90% of all producers contribute to generic promotion. Almost \$450 million was spent on generic promotion and research dollars in 1986, \$194 million of that coming from the dairy industry. Of the total, 82% was spent on advertising for the domestic market. While advertising has been shown to increase sales of certain commodities, concerns have been raised about rising retail prices and cross-commodity effects, particularly with the continued increase in generic promotion.

Bockstael, N.E. and I.E. Strand. 1988. *Pulsed Generic Advertising: The Case of Common Property*. Department of Agricultural Resource Economics, University of Maryland. Using data on Maryland oyster production from 1965-76, an optimal generic advertising strategy was estimated. Results show that over a year was required to adjust the total fish catch to changes in demand, primarily due to the time necessary to invest and divest of capital equipment. Advertising carryover was found to be approximately one year. Intensive advertising for a few years, cutting back to a low level for a few more, and then increasing back to an intermediate level was the suggested strategy.

Boynton, R.D. and L. Schwendiman. 1983. *Theoretical Approaches to the Economies of Advertising. Advertising and the Food System*. North Central Regional Research Publication 287. N.C. Project 117. Monograph 14, pp. 11-46. College of Agriculture and Life Science, Research Division, University of Wisconsin, Madison, WI. Five theories (demand theory, welfare theory, theory of the firm, information theory, and industrial organization theory) are presented here in the context of advertising. Determining optimal firm advertising with the Dorfman-Steiner analysis is one topic, along with the use of advertising as capital. Welfare gains and losses from advertising are also examined, as are the informational and persuasive components of advertising, and the possible benefits of advertising due to decreased consumer search time. Advertising's role in industry concentration and corporate profitability is also discussed.

Bryant, K. 1984. *An Analysis of Cream Advertising*. Staff Paper. Milk Marketing Board. (Unpublished). Using monthly time-series panel data, a series of models was built to examine the impact of advertising on the household market for cream in England and Wales. Own-price elasticities in the range -1.07 to -1.45, depending on cream type, were found, with the more expensive types (grades) exhibiting the higher own-price elasticities. An overall advertising coefficient of 0.0085 was estimated, encompassing the impact of all types of advertising on fresh cream sales. A coefficient for generic advertising is estimated at 0.0058, though both this and the overall advertising coefficient are barely significant (at 90%). Separate equations with consistent results are built for double, whipping, single, and clotted cream grades.

Capps, O., Jr. 1989. *Utilizing Scanner Data to Estimate Retail Demand Functions for Meat*. *American Journal of Agricultural Economics*, 71(3):750-760. Seventy-five weeks of scanner data from a chain of Houston supermarkets were used to estimate individual demand functions for steak, ground beef, roast beef, chicken, pork chops, ham, and pork loin. Analysis was performed using seemingly unrelated regression with a double log functional form. Results included a weighted R^2 of .89, negative own-price elasticities for all products except for ham (not statistically significant), and positive cross-price elasticities for most products, indicating that they are substitutes. Positive and statistically significant own-advertising elasticities were found for all meats other than pork, (steak = 0.0276, ground beef = 0.0331, roast beef = 0.0358, chicken = 0.0350, pork chops = 0.0096, ham = 0.0251, and pork loin = 0.0129). The advertising consisted of weekly supermarket flyers.

Case, K.E. and J.E. Shambharia. 1972. *The Effects of Advertising Carryover*. *Journal of Advertising Research*, 12(3):37-40. A model was estimated to determine whether advertising carryover affected optimal advertising levels, with optimal advertising based on saturation levels and advertising expenditures assumed to be constant for each period. Overall, optimal advertising levels were found to be insensitive to a wide range of carryover periods. This was also true in a less stringent model where product demand and advertising expenditures varied over time. Optimal advertising levels were affected by seasonal demand and competitive spending by other firms, however.

Chalfant, J.A. and J.M. Alston. 1988. *Accounting for Changes in Tastes*. *Journal of Political Economy*, 96(2):391-410. A nonparametric approach was used with meat consumption data from Australia (1962-84) and the U.S. (1947-78) to test if structural changes in meat demand over time were responsible for decreasing per capita consumption or if they were merely due to changes in relative real prices and expenditures. In both countries, they real beef prices rose over the time periods, while real poultry prices fell, consistent with changes in consumption. The null hypothesis of stable consumer preferences was not rejected. Relative prices and expenditure levels were found to completely explain changes in red meat and poultry consumption in both Australia and the U.S. This in turn brings into question promotion attempts to reverse the supposed change in consumer preferences away from red meat.

Chang, H.S. 1987. *Measuring the Effects of Advertising in Food Demand Subsystems*. Ph.D. Dissertation. University of California, Davis, CA. A Linear Expenditure System (LES) and an Almost Ideal Demand System (AIDS) were used to determine the effects of advertising on consumer demand for food, based on data from 1980-84. Expenditure, own-price, and advertising elasticities were determined for meats, dairy foods, cereals and baked items, fruits and

vegetables, and all other foods eaten at home. Overall, the expenditure elasticity estimates were felt to be the most accurate and reliable. Own-advertising was also seen as very important, particularly for the dairy industry with its large component of generic advertising.

Chang, H.S. and R. Green. 1989. *The Effects of Advertising on Food Demand Elasticities*. Canadian Journal of Agricultural Economics, 37(3):481-494. Quarterly expenditure and advertising data from 1980-84 were used with a linear expenditure system (LES) to determine the effect of advertising on demand for five food categories for at-home consumption. Own-price elasticities were estimated as -0.501, -0.027, -0.044, -0.072, and -0.037 for meats, dairy, cereal, fruits and vegetables, and "all else," respectively. In the same order, advertising elasticities were 0.103, 0.123, 0.035, 0.031, and 0.24. Advertising was estimated to have negative effects on expenditure and own-advertising elasticities; thus, it was concluded that advertising has diminishing effects over time and makes consumers less responsive to income changes. The positive effect of advertising on own-price elasticities indicates that increased advertising makes demand for food more inelastic.

Chang, H.S. and H. Kinnucan. 1990. *Advertising and Structural Change in the Demand for Butter in Canada*. Canadian Journal of Agricultural Economics, 38:295-308. The Dairy Bureau of Canada began heavily advertising butter in 1978. A semi-log demand equation was estimated using data from 1973-1986 to determine if this advertising created structural change in the Canadian demand for butter, margarine, shortening, and salad oil. Own-price elasticities were estimated as -1.42, -0.35, -0.17, and -0.28 for butter, margarine, shortening, and salad oil, respectively. Advertising elasticities (in the same order) were estimated as 0.023, 0.006, 0.006, and -0.074; however, only the butter estimate was statistically significant. Overall, it was concluded that the advertising decreased butter's own-price elasticity and increased the demand for butter, while decreasing the demand for margarine.

Chang, H.S. and H. Kinnucan. 1990. *Generic Advertising of Butter in Canada: Optimal Advertising Levels and Returns to Producers*. Agribusiness, 6(4):345-354. Using data from 1978-86, four functional forms (double log, semi-log, log inverse, and inverse) were estimated to determine optimal levels of butter advertising by equating marginal revenues with the marginal cost of advertising. Assumed values for advertising elasticity (0.023), butter consumption (2.39 pounds per quarter per capita), and advertising expenditures (\$0.04 per quarter per capita) were used with each functional form. Optimal advertising expenditures were estimated as \$0.08 per capita per quarter for the log functions compared to \$0.06 for the inverse models. Additional net returns to producers at these optimal levels of advertising were estimated as \$400,000 per quarter for the log forms and \$189,000 per quarter for the inverse functions in 1981 dollars.

Chang, H.S. and H. Kinnucan. 1991. *Advertising, Information, and Product Quality: The Case of Butter*. American Journal of Agricultural Economics, 73: (November), Forthcoming. Quarterly data from 1974-86 were used to estimate the significance of economic factors (prices, income) and noneconomic factors (advertising, health concerns) on demand for Canadian fats and oils based on multi-stage utility maximization with a semi-log functional form. A cholesterol information index was included as a variable. Negative information linking butter and cholesterol was found to affect butter demand four times as much as positive information. The estimated information elasticities were also larger

(absolute value) than the advertising elasticities (-0.29 and 0.02, respectively), indicating that information has a larger impact on butter demand than advertising. Advertising was found to have a positive effect, but reducing exposure to negative information was suggested as being most effective, if possible.

Chang, H.S. and H. Kinnucan. 1991. *Economic Effects of an Advertising Excise Tax*. *Agribusiness*, 7:165-173. In this analysis, commodity check-off programs are seen as a per unit excise tax paid by producers. In terms of welfare economics, this results in increased prices and lower supplies, reducing both producer and consumer surpluses. If effective commodity advertising shifts demand, however, more of the increased "tax" burden is borne by consumers rather than producers. This would also be true if the advertising decreased the elasticity of consumer demand. As long as demand shifts, producers would benefit from the advertising check-off program. Consumers would only experience a welfare gain, however, if the demand shift was large enough to counterbalance the original loss of surplus due to increased prices.

Chavas, J.P. and R.D. Pope. 1984. *Information: Its Measurement and Valuation*. *American Journal of Agricultural Economics*, 66(5):705-710. Four concepts of information are outlined, with the fourth, information as an altering force in probabilistic perceptions of random events, being the focus of the article. Models based on this concept are outlined, using a dynamic formulation allowing for learning over time. Feedback models were found to always be superior to open-loop models, due to the advantage of learning over time. Valuation of information is modeled based on its ability to improve decision making. Information is concluded to be an intermediate good, being the output of an enquiry process and an input into decision making. The article ends with alternative specifications for information and information valuation.

Clarke, D.G. 1976. *Econometric Measurement of the Duration of Advertising Effect on Sales*. *Journal of Marketing Research*, 13(4):345-357. To determine the duration of advertising's effect on sales, 70 econometric studies were examined. Direct lag, polynomial lag, and weighted-average models are discussed, with the Koyck distributed-lag and partial-adjustment models examined in detail. Annual data were found to produce carry-over intervals 17 times as large as monthly data due to data interval bias. For frequently purchased low-cost consumer items, the average advertising duration period was estimated to range from three to nine months, with distributed-lag models concluded to be the best currently available.

Clement, W.E. 1963. *Some Unique Problems in Agricultural Commodity Advertising*. *Journal of Farm Economics*, 45(1):183-194. Characteristics of commodity promotion are discussed, including the need for control of production and marketing functions, and the economic, marketing, and management problems that arise without control. Using promotion in phases to shift demand curves gradually and maintaining prices at equilibrium levels are suggested as a means to avoid overexpansion. Needs for promotion flexibility, knowledge of current market conditions, use of innovative promotions, and retailer education are also mentioned. Internal management problems stemming from lack of power and focusing on short-term results were the final topics covered.

Clement, W.E., P.L. Henderson, and C.P. Eley. 1965. *The Effect of Different Levels of Promotional Expenditures on Sales of Fluid Milk*. USDA, ERS-259, Washington, DC. Fluid milk promotion was tested in one state and five federal milk marketing orders during a two-year period, with three levels of

promotion in each area. Each promotion level was in place for three months, followed by three months of no promotion before the next promotion level was tested. Overall results (including carry-over effects) showed a 4.5% sales increase at the medium promotion level and a 5.9% increase at the upper level. The medium promotion level yielded \$161,000 net returns to producers, versus \$85,000 at the higher level.

Cox, T.L. 1989. *A Demand Systems Approach to the Analysis of Commodity Promotion Programs: The Case of Canadian Fats and Oils*. Staff Paper No. 305. Department of Agricultural Economics, University of Wisconsin, Madison, WI. 38 pp. A Rotterdam-type demand system was estimated for Canadian fats and oils using quarterly data from 1973-86, including both branded and generic advertising data. Nonlinear seemingly unrelated regression analysis was performed on three different model specifications, based on hypothesized effects of the advertising stocks on consumption. The specifications were either "unrestricted" (no explicit hypotheses), additive (translating), or multiplicative (scaling). Results for all three equation types differed from a priori expectations. All advertising elasticities were negative, and the butter and shortening advertising coefficients were not statistically significant. Butter was estimated to have an advertising lag of two to three months.

Dhalla, N.K. 1978. *Assessing the Long-Term Value of Advertising*. *Harvard Business Review*, 56(1):87-95. Problems in assessing the value of advertising include crediting sales to earlier advertising, measuring the duration of the advertising's effect, and reactions of competitors. Distributed-lag models are discussed, including their construction, data requirements, and possible pitfalls. Summaries of ten advertising studies are given, with their methods, results, and advertising elasticities. Advertising on an industry-wide basis was also examined and concluded to be very effective at increasing sales as a whole, particularly in the liquor, wine, and pharmaceutical industries.

Duffy, M.H. 1987. *Advertising and the Inter-Product Distribution of Demand*. *European Economic Review*, 31(5):1051-1070. Annual U.K. consumption data from 1963-83 for beer, wine, and spirits were analyzed using an unrestricted Rotterdam model to determine the effect of advertising on the demand between types of alcohol. Own-price elasticities were estimated as -0.290, -0.505, and -0.774 for beer, spirits, and wine, respectively. In the same order, own-advertising elasticities were estimated as 0.055, 0.096, and 0.147. An unconditional demand equation was also estimated with own-price elasticities of -0.360, -0.854, and -1.129 for beer, spirits, and wine, respectively. In the same order, estimated own-advertising elasticities were 0.047, 0.112, and 0.148. Overall, it was concluded that advertising had a relatively small effect on demand for alcohol, and was less than the effect of relative prices.

Eiler, D.A. and O.D. Forker. 1973. *Testing for Differences in Consumer Attitudes Toward Milk in New York State*. *Journal of Northeastern Agricultural Economics Council*, 2(2):33-50. Five New York markets (New York City, Buffalo, Albany, Rochester, and Syracuse) were surveyed in 1972 using a semantic differential scale to determine their attitudes towards milk. The New York City market was subdivided into white, black, and Spanish segments, and chi-square tests were used to analyze the results. Responses were found to differ significantly (at the 95% level) from the "norm" for each question (other than taste) for at least one or more markets. The markets most different from the "norm" were Albany and the black and Spanish New York City markets, while Syracuse and Rochester were most similar to the "norm."

Eiler, D.A. and S.R. Thompson. 1974. *Adult Attitudes Toward Major Beverages in Seven New York Metropolitan Markets*. SEARCH, 4(10):1-47. Seven beverages were used in a 1972 seven-market study of consumer attitudes (white, black, and Hispanic subsections of New York City SMSA, Buffalo SMSA, Rochester SMSA, Albany-Schenectady-Troy SMSA, and Syracuse SMSA). Chi-square tests were used to determine significant attitude differences in each market, differences in black and Hispanic attitudes versus the other five markets, and differences in attitudes between consumers and nonconsumers of each beverage. Overall, blacks' and Hispanics' attitudes were found to be more similar to each other than to the predominately white markets.

Ekelund, R.B. and D.S. Saurman. 1988. *Advertising and the Market Process: A Modern Economic View*. Pacific Research Institute for Public Policy, San Francisco, CA. 212 pp. Chapters include "Advertising as an Economic and Social Issue," "The Traditional Economic Critique of Advertising," "Entry Barriers, Information, and the Rational Consumer," "Information and Competitive Market Structure," "Brand Loyalty, Entry, and Scale Economies," "Concentration of Industry, Prices and Quality," "A Modern Economic View of Advertising: Recent Case Studies," "Regulation, Fraud, Economic Stabilization, and Free Speech," and "Conclusion: Advertising and the Competitive Process." It is concluded that advertising is a necessary part of the economic process and can actually work to decrease market power, while providing information to consumers unavailable from any other source.

Fairchild, G.F., D.L. Gunter, and J.Y. Ling. 1987. *The Impact of Florida's Import Advertising Equalization Tax on the Florida Orange Juice Industry*. Agribusiness, 3(2):179-188. Since 1970, Florida has exacted an equalizing excise tax on imported citrus products. Due to a number of hard freezes in the 1980s, use of imported products (primarily Brazilian) has increased dramatically, thus increasing tax returns. In 1984-85 this revenue accounted for 33% of total orange excise taxes and was used to pay for 30% of Florida's generic citrus advertising expenditures. While removal of the tax would provide a temporary price advantage to Florida producers, it would soon be outweighed by decreased demand from the reduction in advertising. Also it is not clear how Brazil would react to elimination of the import tax.

Falk, H. and J.C. Miller. 1977. *Amortization of Advertising Expenditures*. Journal of Accounting Research, 15(1):12-22. The Almon polynomial model was used to estimate the relationship between advertising and sales in the car industry, using data from 1970-75. Four firms were found to have increasing effects from advertising over time while others had advertising with longer carry-over effects than desirable, particularly as new car models are introduced annually. It was concluded that advertising affects sales differently in each firm, and advertising expenses should be amortized on an individual firm basis over the periods affected, not just during the period of spending.

Forker, O.D. and D.J. Liu. 1986. *An Empirical Evaluation of the Effectiveness of Generic Advertising: The Case of Fluid Milk in New York City*. A.E. Research 86-12. Department of Agricultural Economics, Cornell University, Ithaca, NY. 34 pp. Using monthly data from 1971-84, a demand equation for fluid milk in New York City was estimated using nonlinear least squares. Advertising and income elasticities were estimated as 0.042 and 0.57, respectively, with an R^2 of .73, and a two-month lag estimated for advertising. To determine the optimal advertising expenditures, fluid milk supply and demand were simulated using from 10% to 150% of the actual advertising budget. It was estimated that

per capita milk consumption would decrease 1/2 pound if advertising was 10% of the actual level and increase by 1/10 of a pound at 150% of the actual level. While returns to advertising were found to be \$1.40 for each \$1.00 spent, optimal advertising expenditures were estimated to be approximately 65% of the current advertising budget.

Forker, O.D. and D.J. Liu. 1989. *Commodity Promotion: Who Benefits and By How Much?* Choices, Third Quarter 1989, pp. 8-11. Over half a billion dollars was spent on commodity promotion in 1988, with dairy, beef, and pork together accounting for three-fifths of the total. Commodity promotion programs may or may not help producers, depending on market structures and government involvement in surplus purchases. Producers of products not covered in promotion programs may also be hurt due to increased consumption of rival products. To accurately assess the effectiveness of commodity promotion and its effects on producers and consumers, more data must be collected, either through producer cooperation across programs or increased government involvement.

Forker, O.D. and D.J. Liu. 1989. *Generic Dairy Promotion Economic Research: Past, Present, and Future*. A.E. Staff Paper 89-34. Department of Agricultural Economics, Cornell University, Ithaca, NY. 25 pp. An overview of advertising evaluation models such as single demand equations, simultaneous supply and demand models, industry models, and demand-system models is provided, outlining advantages and drawbacks of each. Using simulations versus optimal control models is discussed, followed by a brief literature review and summary of empirical results. Future research goals and citations for each of the dairy promotion research publications published by the Cornell University Agricultural Economics Department from 1973-89 are included.

Forker, O.D., D.J. Liu, and S.J. Hurst. 1987. *Dairy Sales Data and Other Data Needed to Measure Effectiveness of Dairy Advertising*. A.E. Research 87-25. Cornell University, Ithaca, NY. 216 pp. This study was designed to determine types of data necessary for evaluation of generic milk promotion programs, provide an inventory of data currently available, and identify further data needs. An evaluation data base was recommended using private market research firms and containing both at-home and away-from-home dairy product consumption as well as actual advertising expenditures. A management information system (MIS) was also recommended, incorporating the evaluation data base with simplified evaluation models for use by promotion management. The data inventory contains information on USDA and other public data sources as well as services available from private market research firms.

Forker, O.D. and R.W. Ward. 1988. *Generic Advertising: A Marketing Strategy for Farmer Groups*. In 1988 Yearbook of Agriculture, Washington, DC, pp. 44-49. Over 90% of producers participate in generic commodity promotion, with 80 farm commodities covered. Successful commodity promotion depends upon several factors, including current consumption levels, availability of consumer information, maintenance of product quality, easy product recognition by consumers, and product versatility. Promotion programs are also more useful if the commodity can be produced at a relatively uniform level of quality by a large number of producers. All producers should share in promotion costs equitably, and brand differentiation, if any, should be minimal.

Funk, T.F., K.D. Meilke, and H.B. Huff. 1977. *Effects of Retail Pricing and Advertising on Fresh Beef Sales*. American Journal of Agricultural Economics, 59(3):533-537. A retail demand function for beef was estimated using data from

two supermarket chains for 1974-75. In general, higher-quality cuts were more price-elastic, with advertising elasticities tending to be considerably smaller than price elasticities. Few relationships were found between prices of one cut and sales of another. Pork prices influenced beef sales more than veal or lamb prices. In one chain, beef ads and specials were much more effective in increasing beef sales than in the other chain, indicating probable differences in both the management and clientele of the chains.

Gallo, A. 1984. *Advertising and Promotion in Food Marketing*. USDA Staff Report 831007. Washington, DC. Food is the most heavily advertised of all products. Forty percent of consumer advertising dollars were for television, 25% for print ads, and 25% for promotions. Promotions by fast-food restaurants rose to \$600 million by 1979 (11% of all food advertising). Highly processed foods accounted for around 20% of consumers' food budgets but 50% of all advertising dollars, while produce, meats, and dairy items accounted for only 8% of all advertising. At the time, generic food advertising represented less than 1% of all food advertising.

Gallo, A.E. and L.G. Hamm. 1982. *Coupons, Parts I and II*. National Food Review, 18(Spring):11-15 and 19(Summer):12-16. "Coupons, Part I" contains statistics on couponing, including number of consumers using coupons, manufacturers' expenditures for coupons, rates of coupon redemption, average value of coupons, percent of advertising composed of couponing, and demographics of coupon users. "Coupons, Part II" included types of foods couponed most, coupons' effect on retailers, magnitude of fraud or misredemption of coupons, and reasons behind double couponing. As the products most heavily couponed tend to have the smallest farm-value percentages, couponing was found to have little effect on farm prices or demand.

Gallo, A.E., L. Hamm, and J.A. Zellner. 1982. *Couponing's Growth in Food Marketing*. AER-486. USDA. Coupons are distributed in print media, mailed directly to homes, or included with product packaging. Highest redemption rates were reported for coupons on packages, followed by direct mail, and Sunday-supplement inserts. Lowest redemptions were for coupons in daily newspapers. A 1977 survey found 80% of households using coupons, with 39% of all coupons redeemed being for nonfood items. Due to increases in coupon distribution, coupon redemption rates declined to 1 out of 20 by 1980. Coupons were most effective when coordinated with a total advertising plan, including retail support and media advertising.

Goddard, E.W. 1990. *Demand for Fruit in Ontario: A Case Study of Apple Advertising Effectiveness*. Working Paper WP90/24. Department of Agricultural Economics and Business, University of Guelph, Guelph, Ontario. 15 pp. Using data from 1966-88, a two-stage model (an Almost Ideal Demand System) was estimated to determine demand for 14 fruits for the first stage, and specifically determining the demand for domestic and imported apples in the second stage. Advertising was only included in the second-stage demand estimation ($R^2 = .94$). Domestic and imported apples were determined to be both gross and net substitutes, with advertising elasticities being positive for domestic apples (0.008) and negative for imported apples (-0.01). Own-price elasticities were -1.15 and -1.08 for domestic and imported apples, respectively. Simulations estimated that each dollar spent advertising domestic apples increased net revenues by \$12.00.

Goddard, E.W. and A.K. Amuah. 1989. *The Demand for Canadian Fats and Oils: A Case Study of Advertising Effectiveness*. *American Journal of Agricultural Economics*, 71(3):741-749. A log-linear aggregate model and an expenditure share model were estimated using data from 1973-86 to determine the own and cross-commodity effects of Canadian generic butter advertising. Own-advertising elasticities were 0.01, 0.04, 0.03, and 0.07 for butter, margarine, shortening, and vegetable oils, respectively, indicating that butter would be the least responsive to a 1% increase in advertising. However, butter advertising had a much larger effect on margarine demand (-.81) than vice versa (-.06). Butter advertising also negatively affected shortening and vegetable oil demand (cross-advertising elasticities of -2.79 and -3.68, respectively). Returns to butter advertising were estimated at \$1.11 for each dollar spent compared to a \$1.31 return to margarine advertising.

Goddard, E.W. and A. Tielu. 1988. *Assessing the Effectiveness of Fluid Milk Advertising in Ontario*. *Canadian Journal of Agricultural Economics*, 36(2):261-278. A two-stage time-series demand-system model was estimated to determine the effectiveness of fluid milk advertising in Ontario. OLS was used with data from 1971-84 for fluid milk, soft drinks, and juices. The aggregate expenditure estimation found price, advertising, and habit formation to be statistically significant at the 1% level with an adjusted R^2 of .84. Own-price and advertising elasticities for milk were estimated at -0.224 and 0.004, respectively. It was estimated that for each additional \$1.00 spent on fluid milk advertising, net retail revenues would increase \$8.00.

Goddard, E.W. and A. Tielu. 1988. *The Importance of Including Demographic Variables When Examining the Impact of Advertising Fluid Milk in Ontario*. WP88/11. Department of Agricultural Economics and Business, University of Guelph, Ontario. 21 pp. A two-stage demand system was used to estimate the effect of demographic factors on milk demand in Ontario. The first stage was specified as log-linear, with a translog indirect utility function used to define the second stage. Results from the first-stage estimation found age to be the only statistically significant demographic variable. Advertising elasticity for fluid milk was estimated as 0.002. To simulate increased fluid milk advertising with an unlimited milk supply, two models were estimated, one with and one without demographic variables. Each showed decreasing marginal returns to advertising and increased net returns to farmers.

Goldman, A. 1988. *Consumer Response to Premium Quality Branded Produce: The Case of Israeli Glasshouse Tomatoes*. *Applied Agricultural Research*, 3(5):264-268. In 1985, acceptance of Israeli tomatoes was tested in six U.S. and Canadian supermarkets in comparison with Florida tomatoes and other vine-ripened varieties. The Israeli tomatoes were branded with special tags and featured in TV, print, and in-store advertising and priced approximately 100% higher than the competitors'. A total of 515 tomato consumers were interviewed in the stores, with follow-up telephone interviews to 282 of the original group. Consumers did purchase the premium tomatoes and became "loyal" by repeating purchases throughout the study. By eight weeks after their introduction, the Israeli tomatoes had obtained a 25% to 56% market share in these supermarkets. Preferred attributes of the Israeli tomatoes included improved taste and appearance, both external and internal.

Green, R.D., H.F. Carman, and K. McManus. 1991. *Some Empirical Methods of Estimating Advertising Effects in Demand Systems: An Application to Dried Fruits*. *Western Journal of Agricultural Economics*, 16(1):63-71. Two approaches

to incorporating advertising effects into Almost Ideal Demand System (AIDS) models are presented, as is a double-log demand system with advertising effects. Both AIDS models and the double-log model included cross-commodity advertising effects. The models were estimated for California dried figs, prunes, and raisins, using annual data from 1957 through 1986. Although the AIDS models have the advantage of satisfying theoretical restrictions to a greater degree than does the double-log model, the estimation results "were similar but with some differences in the magnitude and signs of individual estimated coefficients." Estimated own- and cross-advertising effects are small relative to price and expenditure effects. The authors note that the small advertising effects do not necessarily imply that advertising is unprofitable; they provide an example to illustrate this point. Some of the estimated cross-commodity advertising effects were asymmetric in this study, but demand theory does not dictate that such effects need be symmetric. The authors note that their study was hampered by "serious weaknesses in data" and recommend that more attention be given to collecting better data on which to base analyses of commodity promotion programs.

Hall, L.L. and I.M. Foik. 1982. *Generic Versus Brand Advertising for Manufactured Milk Products--The Case of Yogurt*. North Central Journal of Agricultural Economics, 5(1):19-24. A polynomial distributed-lag model was used to estimate a linear equation with per capita yogurt sales as the dependent variable based on California data from 1976-79. It was found that brand advertising's effect on sales peaked two to three months after expenditures, with a lag length of seven months versus a lag length of five months for generic advertising. Generic advertising's effectiveness was found to decline geometrically, with no initial build-up. Due to the low effectiveness of yogurt generic advertising and the decreased farmer returns from increasing Class II usage versus Class I, it did not appear profitable to switch funds from generic fluid milk advertising to yogurt advertising.

Halloran, J.M. and M.V. Martin. 1989. *Should States be in the Agricultural Promotion Business?* Agribusiness, 5(1):65-75. This article presents six scenarios facing states that are becoming increasingly involved in promoting their own agricultural products. The scenarios' titles are themselves relatively self-explanatory so only they will be presented: "Increasing Demand and the 'Free Rider' Problem," "Product Differentiation by State of Production," "Successful Promotion, Wrong Beneficiary," "Carving Out a New Market Niche," "Gaming Theory Implications," and "The Impact Measurement Dilemma." Overall, the question is raised whether these concerns are outweighed by individual state's benefits.

Hanssens, D.M. 1980. *Bivariate Time-Series Analysis of the Relationship Between Advertising and Sales*. Applied Economics, 12(3):329-339. An ARIMA and a dynamic shock model were calculated using Lydia Pinkham data from 1954-60. For overall forecasting ability, the structural model specified performed best for both advertising and sales. The duration of the advertising lag period was estimated at 4.5 months, with no advertising effect for the first month. The ARIMA model also did well as a forecasting model, despite its "naive" qualities. The need for a simultaneous equations model was also discussed.

Henderson, P.L. 1974. *American Long Grain Rice: Sales Impact of a Promotional Program in France*. MRR-1022. USDA, Agricultural Marketing Service, Washington, DC. A major promotion of American long grain rice began in France in 1968. Using data from 1966-70, total rice purchases showed statistically significant increases in 1969 (after one year of the promotion), but with no

change seen in 1970. The increase was due primarily to increased consumption per household. It was concluded that the promotional campaign was effective, particularly in the first year, but less effective for women under 35. Advertising recall surveys found that one-third recalled rice advertisements, with two-thirds remembering ad content. Of those remembering ad content, however, only 2% recalled the emphasis on American rice. Recipes used in advertisements were remembered most frequently.

Henderson, P.L. 1976. *Butter and Cheese: Sales Changes Associated with Three Levels of Promotion*. AER-322. USDA, ERS, Washington, DC. Using data from 1972-73, butter, margarine, and cheese sales were examined under three different levels of promotion and compared to sales with no promotion. The maximum gain in butter sales was 4.3%, although results may have been skewed by competitive promotions by margarine manufacturers. Each 1% increase in margarine advertising decreased butter sales by .5%. Cheese sales peaked at the intermediate promotion level with an 18% increase in sales. It was concluded that a \$.09 per capita annual investment would be required for butter and \$.06 for cheese. At these levels, the returns, particularly from the butter promotion, would not cover milk production costs. If the promotions created a sufficient demand for milk, however, it could increase milk prices. A \$.03 increase per cwt. would make the promotions profitable.

Henderson, P.L. and W.E. Clement. 1962. *Some Guides for Improving Commodity Promotional Programs*. No. 75, pp. 33-37. USDA, ERS, Marketing Economics Division, Washington, DC. A survey of producers, food processors, marketing cooperatives, and ad agencies found that generic promotion often neglected to take product availability, price, and customer base into account. Specific and realistic marketing goals and objectives were recommended as well as a board of directors with final responsibility for making promotional decisions. Staff specialists were also recommended to assist with promotion follow-through as well as more careful selection of ad agencies. Development of a program of market and promotion research was the final recommendation.

Herrmann, R.O., R.H. Warland, and B.J. Smith. 1988. *Assessing the Impact of Milk Advertising: A Survey of U.S. and Pennsylvania Adults*. Marketing Research Report 4, AE and RS 199. Department of Agricultural Economics and Rural Sociology, Pennsylvania State University, State College, PA. Telephone survey data from the U.S. and Pennsylvania in 1987 were compared to determine awareness of generic milk promotion advertising on television. Overall, data were very similar from both studies. Younger consumers, females, whites, and those with more education had the highest awareness of the advertising. Of those aware of ads, over 77% recalled ad content, particularly nutritional benefits and slogans. Blacks, younger consumers, and more educated consumers identified most strongly with the ads. Less than 15% of those aware of ads, however, felt the ads had changed their attitudes towards milk and less than 7% felt that the ads increased their consumption of milk.

Hessner, C. and C.J. Mellor. 1986. *An Empirical Analysis of the Relationship Between Advertising and Sales: A Case Study of the Liquid Milk Market*. University of Exeter, *Journal of Agricultural Economics*, 37(2). The authors use time-series analysis to build univariate models of advertising spending and liquid-milk sales. Correlation between the residuals in both series is then attempted in order to see whether or not a relationship appears to exist. In examining the liquid-milk market in England and Wales, little correlation is

found, leading the authors to conclude that there is no reason to suggest that sales are affected by current or lagged advertising.

Hochman, E., U. Regev, and R.W. Ward. 1974. *Optimal Advertising Signals in the Florida Citrus Industry: A Research Application*. *American Journal of Agricultural Economics*, 56(4):697-705. Data from 1967-72 were used with OLS to estimate the relationship between generic citrus advertising and consumer sales. A sales saturation level of \$160 million yielded the best R^2 (.82) and the most significant advertising coefficient. Without seasonality, quarterly sales were \$134 million with optimal advertising of \$4.1 million per quarter. At sales levels below \$100 million, however, any level of advertising increased sales. Comparing 1968-71 actual Florida generic advertising expenditures (\$42.4 million) and sales (\$1,788 million) to "optimal" advertising expenditures (\$86.1 million) and sales (\$1,913 million) demonstrates that the optimal level of advertising would have increased sales by \$81.3 million.

Hollis, N.S. 1991. *Separating Advertising from Promotional Effects with Econometric Modeling*. *Journal of Advertising Research*, 30(3):RC6-12. A non-quantitative approach is used to explain econometric modeling for the evaluation of the long- and short-term effects of British brand advertising. A case study using a food product targeted for children is examined, comparing the effectiveness of a new advertising program to that of the previous campaign. The importance of allowing for the effects of factors other than price and advertising is stressed, as well as the presence of long-term effects not seen immediately. The concept of quality advertising versus quantity is also raised, as is the need for advertising that is effective in increasing brand awareness. The use of nonmedia promotions is also discussed.

Homatenos, D. 1982. *The Effectiveness of Advertising for Butter*. Staff Paper. U.K. Milk Marketing Board. (Unpublished). Monthly panel data were used to assess the impact on household purchases of butter advertising. Both generic and branded advertising were considered and elasticities calculated, which were significant (0.061 and 0.010, respectively). An own-price elasticity of -0.403 was estimated. The model suggested that generic advertising was more effective than branded advertising in expanding the butter market. It also suggested diminishing returns to advertising.

Hoofnagle, W.S. 1963. *The Effectiveness of Advertising for Farm Products*. *Journal of Advertising Research*, 3(4):2-6. An overview of USDA generic advertising evaluation, this article examines the types of studies used at the time (both qualitative and quantitative), variables measured (usually sales), techniques used (time series, test versus control areas, regression analysis, and rotational experiments), and the situations each is best suited for, as well as the advantages and disadvantages of each method.

Hoos, S. 1959. *The Advertising and Promotion of Farm Products--Some Theoretical Issues*. *Journal of Farm Economics*, 41(2):349-363. Issues discussed include the effects of advertising on demand and prices, intrinsic differences between advertising commodities and nonfarm items, difficulties in deriving marginal productivity functions for advertising and promotion, using modified price-discrimination models for advertising analysis, measuring advertising carryover using distributed lags, advertising optimization techniques, consumers' attitudes toward the product, problems of inventory management with commodities, reconciling long-run concerns with short-run management techniques, and advertising's effects on consumer preferences.

Huston, J.L., J.C. Cordray, and J.O. Reagan. 1987. *The New Beef and Pork Promotion Programs*. Proceedings of the 40th Annual Reciprocal Meat Conference. National Live Stock and Meat Board, Chicago, IL. In 1985 the Farm Act provided for beef and pork promotion programs. The beef program is funded through a \$1.00 check-off per head, with \$0.50 distributed through the state Beef Councils and the other \$0.50 going directly to the national Beef Board. The pork program receives \$0.25 for each \$100 in producer sales, all of which is distributed by the national Pork Board. In total, 51% of all beef funds and 70% of pork funds are used for promotion, with the rest going for research, consumer information, and administration. Approximately 10% of producers in both programs request refunds.

International Dairy Federation. 1988. *Recent Views on the Marketing of and Promotion for Milk and Milk Products*. International Dairy Federation Bulletin 224. Brussels, Belgium. 35 pp. This publication includes a series of ten articles covering a gamut of dairy products and national perspectives. The first two articles deal with the U.S. dairy industry and promotion programs, while the second two articles discuss the development of butter blends in the U.S. and butter marketing in France (in French). Finnish milk marketing, Scandinavian agricultural policies, and Dutch cheese marketing are covered in the next three articles. The last three articles concern dried milk and milk proteins and their possible uses as food ingredients.

Jensen, H. and T. Kesevan. 1987. *Generic Advertising of Food Product Characteristics*. 33rd Annual Conference Proceedings of the American Council on Consumer Interests, V. Hampton, ed., pp. 243-247. University of Texas, Austin, TX. Using advertising tracking-study data from 1985-86, an information-decision model was estimated to determine the effectiveness of generic dairy calcium advertising on dairy product consumption. Variables included awareness of advertising; consumers' opinions of importance of calcium; education; race; income; age; employment and marital status; and presence of children. Besides the effects of socioeconomic variables, advertising was found to increase dairy product consumption, although not significantly. Awareness of calcium and health did significantly affect dairy consumption, however.

Johnson, S.R. and H. Jensen. 1987. *Evaluation of the National Dairy Board Calcium Program and the Effectiveness of Calcium Advertising*. Center for Agricultural and Rural Development, Iowa State University. 85 pp. Two sources of nutrition data (Nationwide Food Consumption Survey, 1977-78; and Continuing Survey of Intakes by Individuals, 1985-86) were used to determine differences in calcium consumption over time using tabular analysis. Multivariate analysis was also performed to estimate the effect of socioeconomic variables on women's calcium consumption. A consumer-preference model was also estimated to determine the effect of consumers' knowledge about dairy products and their calcium content on consumption using data from the calcium ad tracking study, 1985-86. It was concluded that knowledge of calcium and its importance did increase dairy consumption, but there was no statistical difference in knowledge between those who had seen the advertising and those who had not.

Jones, E. and R.W. Ward. 1989. *Effectiveness of Generic Brand Advertising on Fresh and Processed Potato Products*. *Agribusiness*, 5(5):523-536. A 13-equation demand model was specified using data from 1970-85 to estimate the effect of advertising on fresh, frozen, and dehydrated potatoes, and potato chips. While generic advertising did not have a statistically significant effect on fresh potatoes, it was associated with positive attitudinal changes which may

then lead to increased consumption in the future. Generic advertising was statistically significant for frozen and dehydrated potatoes, with advertising elasticities of 0.054 and 0.071, respectively. Advertising simulations were also estimated, showing potential increases in sales if generic advertising was increased by 3% and 6% individually for the potato products.

Kinnucan, H.W. 1981. *Performance of Shiller Lag Estimators: Some Additional Evidence*. A.E. Research 81-8. Department of Agricultural Economics, Cornell University, Ithaca, NY. 20 pp. The Shiller technique was derived as an alternative to OLS and the Almon procedure for estimating distributed lags. It is less restrictive than the Almon procedure and provides more accurate estimations of the shape of the distribution than usually available with OLS and handles multicollinearity more efficiently. The Shiller technique was tested by reestimating a milk sales response function (previously estimated with the Almon and OLS) using TROLL software. The Shiller procedure was found to be more efficient than either OLS or the Almon, particularly in determining the lag-distribution pattern. The advertising elasticity increased 27% using the Shiller technique, indicating previous estimations of optimal generic milk advertising expenditures may have been seriously understated.

Kinnucan, H.W. 1981. *Seasonality of Long-Run Advertising Elasticities for Fluid Milk: An Application of Smoothness Priors*. A.E. Research 81-9, Department of Agricultural Economics, Cornell University, Ithaca, NY. 23 pp. The smoothness estimator restricts the amount of variation in coefficients of adjacent seasonal dummy variables. This increases the efficiency of the estimation by reducing multicollinearity while still allowing for seasonality. This technique was tested by reestimating long-run milk sales data from 1975-78 to determine the seasonality of advertising response and then comparing the results to the original OLS model. The smoothness estimates did increase efficiency but the coefficients were not as statistically significant as in the original estimation. However, based on Mean Square Error and chi-square tests, the smoothness estimations were found to be superior to the OLS results.

Kinnucan, H.W. 1983. *Media Advertising Effects on Milk Demand: The Case of the Buffalo, New York Market (with an Empirical Comparison of Alternative Functional Forms of the Sales Response Equation)*. A.E. Research 83-13. Department of Agricultural Economics, Cornell University, Ithaca, NY. 36 pp. A regression equation was used to estimate per capita daily fluid milk sales in Buffalo, NY using data from 1978-81. Five functional forms were used: linear, logarithmic, semilogarithmic, log-inverse, and inverse. Using the results from the logarithmic equation, milk price elasticity was estimated at -0.73 and long-run advertising elasticity at 0.121. Generic fluid milk advertising in Buffalo during the period was \$1.52 million (\$0.25 per capita annually). Overall, generic fluid milk advertising in Buffalo increased per capita sales by 1.2 to 1.6 gallons per year for an average return of \$16.85 to \$22.52 per dollar spent. Based on a Class I-Class II differential of \$2.54, optimal advertising expenditure estimates ranged from \$0.499 to \$1.124, compared to \$0.25 actual expenditures.

Kinnucan, H. 1986. *Demographic Versus Media Advertising Effects on Milk Demand: The Case of the New York City Market*. *Northeastern Journal of Agricultural and Resource Economics*, 15(1):66-74. Using data from 1971-80, a double-log demand function was specified to estimate per capita fluid milk sales. Results (using OLS and TROLL) included an adjusted R^2 of .87, estimated income elasticity of 0.416, positive and significant cross-elasticities for coffee and

cola, and a long-run advertising elasticity of 0.051. Race elasticity was estimated at -0.593 and age elasticity at 0.722 (both 99% significant). As percent nonwhite increases and percent under 20 years old decreases, per capita milk consumption decreases. Generic advertising was estimated to have raised fluid milk consumption in New York City by an average of 2.5 gallons per capita from 1972 to 1979. Net farm value of this increase was \$37 million, or a net return of over \$6.00 for each dollar spent.

Kinnucan, H. 1986. *Product Allocation of Generic Advertising Funds: A Sales Maximization Approach with an Application to Milk and Cheese in New York City*. Agricultural Economics Staff Paper 86-14. Cornell University, Ithaca, NY. 21 pp. Monthly sales data on fluid milk (1971-80) and cheese (1977-81) were used to determine the optimal allocation of generic advertising funds between these two products in the New York City market. Logarithmic functional forms were used, permitting advertising to have diminishing marginal returns. Milk and cheese were estimated to have long-run advertising elasticities of 0.05096 and 0.0593, respectively. By allocating 60% of generic advertising to fluid milk and 40% to cheese (versus the actual allocation of 87% for milk, 13% for cheese), it was estimated that milk-equivalent sales might rise as much as 1.17%, or 8.21 million gallons annually in New York City.

Kinnucan, H. 1987. *Effect of Canadian Advertising on Milk Demand: The Case of the Buffalo, New York Market*. Canadian Journal of Agricultural Economics, 35(1):181-196. Logarithmic and log-inverse equations were used with OLS to estimate per capita fluid milk sales in Buffalo, NY. In the logarithmic form, income elasticity was estimated to be 0.35, milk price elasticity at -0.73, cola price at 0.51, trend at -0.0005, and advertising elasticity at 0.121. Log-inverse elasticities for the same variables were 0.0001, -1.52, 0.004, -0.0006, and 0.00083, respectively. Both equations showed maximum advertising effectiveness at two months, with the effect disappearing by six months. As the generic advertising expenditures were less than the Class I-Class II differential, it was concluded that advertising was profitable. Advertising was estimated to be responsible for a 1.35 to 1.54-gallon increase in annual per capita fluid milk sales, with a net value to farmers of \$1.6 million to \$1.9 million.

Kinnucan, H. and E. Belleza. 1991. *Advertising Evaluation and Measurement Error: The Case of Fluid Milk in Ontario*. Canadian Journal of Agricultural Economics, 39:(Forthcoming). A double-log demand equation was estimated using quarterly data from 1973-84 to determine the effects of using "tracking" data from fluid milk television advertising. Advertising elasticities ranged from zero to 0.347 depending on data used, compared to 0.044 when using actual rather than "tracking" data. Price elasticities ranged from -0.18 to -0.23 (short-run) and -0.27 to -0.675 (long-run). Using "tracking" data rather than actual figures were found to understate advertising expenditures by 18%, and "tracking" data were statistically uncorrelated with the actual data. It was also determined that using "tracking" data downwardly biases advertising elasticities.

Kinnucan, H. and D. Fearon. 1984. *Econometric Measurement of the Sales Response to Generic and Brand Advertising of Cheese*. Agricultural Economics Staff Paper 84-21. Cornell University, Ithaca, NY. 39 pp. Household panel data for 1979-81 were used to estimate the effects of generic and branded advertising on cheese sales in New York City. Generalized least squares was used for the estimation. Depending on functional form, generic long-run advertising elasticities ranged from 0.0348 to 0.088, compared to 0.182 to 0.205 for branded advertising. Effective advertising lag times were estimated to be much longer

for branded advertising (54 months) than for generic advertising (16 months). If branded advertising was increased by one cent per capita per month, it was estimated cheese sales would increase by 0.63% versus a 4.5% increase for a similar rise in generic advertising.

Kinnucan, H. and D. Fearon. 1986. *Effects of Generic and Brand Advertising of Cheese in New York City with Implications for Allocation of Funds*. North Central Journal of Agricultural Economics, 8(1):93-107. Logarithmic and log-inverse equations were used with New York City household panel data from 1979-81 to estimate per capita daily cheese sales. R^2 was .86 (in both equations), long-run generic advertising elasticity in the logarithmic equation was estimated at 0.0593 (0.0367 in the log-inverse), and long-run brand advertising elasticity estimated at 0.202 for the logarithmic (0.205 for the log-inverse equations). Advertising carryover was estimated at 16 months for generic advertising and up to 54 months for brand advertising. Comparing producer returns, it was found that increasing generic cheese advertising funds by \$0.01 per capita per month increased sales 3.2 times more than increasing fluid milk advertising by the same amount.

Kinnucan, H.W. and O.D. Forker. 1986. *Seasonality in the Consumer Response to Milk Advertising with Implications for Milk Promotion Policy*. American Journal of Agricultural Economics, 68(3):563-571. Using data from 1971-80, demand equations were specified with and without seasonal dummy variables to estimate daily per capita fluid milk sales. The seasonal "goodwill" elasticities follow milk sales in that they peak in spring and decline over the summer. This indicates that advertising is most effective when consumers' preferences for fluid milk are also strongest. Estimated optimal monthly advertising expenditures were found to peak in the first quarter and be lowest in the third quarter (30%, 25%, 20%, and 25% for each quarter, respectively). Under these optimal advertising ratios, estimated monthly fluid milk sales were projected to increase 0.78% (218 ounces), with a farm value of \$4,046,557. This would have increased producer returns by 9%.

Kinnucan, H.W. and O.D. Forker. 1987. *Asymmetry in Farm-Retail Price Transmission for Major Dairy Products*. American Journal of Agricultural Economics, 69(2):285-292. Four models were used to estimate monthly undeflated retail prices for fluid milk, butter, cheese, and ice cream. The null hypothesis that retail prices react symmetrically to farm-level prices was rejected for each equation. Lag times for farm-level price increases were shorter in each case than lag times for price decreases, and long-run rising farm price elasticities exceeded falling price elasticities by 40% for fluid milk, 16% for cheese, 69% for butter, and 238% for ice cream. Another equation was tested to determine if retail demand shifts were responsible for the asymmetric dairy pricing. Results showed small elasticity differentials (<6%) in times of demand shifts, indicating demand shifts were of little importance in dairy pricing asymmetry.

Kinnucan, H. and O.D. Forker. 1988. *Allocation of Generic Advertising Funds Among Products: A Sales Maximization Approach*. Northeastern Journal of Agricultural and Resource Economics, 17(1):64-71. Logarithmic equations were estimated using data from 1971-81 to optimize generic dairy advertising funds for maximum sales of cheese and fluid milk in New York City. Long-run advertising elasticities were 0.051 for the milk equation and 0.0593 for the cheese. Reallocating generic advertising funds toward cheese and away from fluid milk would result in a 1.17% increase in milk-equivalent sales (from 13.72 ounces to 13.88 ounces per capita), an increase in sales of 8.21 million gallons annually

(milk-equivalent). Spending an additional \$.01 per day per capita on fluid milk and cheese advertising (60% on milk, 40% on cheese) would further increase per capita milk-equivalent consumption by 10.22 ounces annually. The producer returns at this level of advertising were estimated to be \$11.29 for each dollar spent.

Kinnucan, H.W., J.H. Molnar, and B.R. Min. 1988. *Industry Attitudes Towards a Dairy Check-Off Program in Korea: An Application of Institutional Innovation Theory*. *Journal of Rural Development*, 11(1):85-95. Questionnaires were sent to Korean producers and processors to determine attitudes toward a mandatory dairy check-off program. Survey results indicated favorable attitudes by both groups, but each felt the other should finance it. Seventy-four percent of farmers and 88% of processors were in favor of a referendum. Farmers felt on average that 1.12% of farm price would be the maximum acceptable assessment, while processors were willing to contribute up to 1.86% of the farm price. It was concluded that attitudes toward a check-off program were favorable overall, but that the majority of farmers were not informed well enough about the mechanics of a mandatory program.

Kinnucan, H., S.R. Thompson, and H.S. Chang, eds. Forthcoming 1991. *Commodity Advertising and Promotion*. Iowa State Press. 400 pp. This is a collection of papers presented at the February 1989 NEC-63 conference on the effects of commodity promotion on commodity markets, producer returns, and consumer purchases. Topics include livestock promotion, use of panel data to measure a program's effectiveness, commodity promotion in Canada, the effect of dairy promotion on farm-level supply, using a Rotterdam model to measure the effects of advertising, evaluation of split-cable scanner data, fresh and processed potato promotion, generic versus brand advertising, as well as a look to future directions.

Kinnucan, H.W. and M. Venkateswaran. 1990. *Effects of Generic Advertising on Perceptions and Behavior: The Case of Catfish*. *Southern Journal of Agricultural Economics*, 22(2):137-151. A telephone survey was used to gather data to evaluate the effectiveness of a 1986 print campaign for the catfish industry. An eight-equation model was estimated to determine the effectiveness of this advertising based on consumer awareness, beliefs, and purchases. Advertising was found to be effective in increasing consumer awareness of farm-raised catfish. Consumers' previous experiences with catfish were also highly significant, as were socioeconomic variables, particularly race, education, and census region. Overall, the advertising had the greatest impact on awareness and purchase frequency, with little effect on attitudes or beliefs (i.e., it "reminded" consumers effectively about the product but did little to change overall attitudes).

Kinnucan, H.W. and M. Venkateswaran. 1991. *Economic Effectiveness of Advertising Aquacultural Products: The Case of Catfish*. *Journal of Applied Aquaculture*, 1(1):3-31. An eight-equation model was specified to examine the impacts of generic catfish advertising on consumers' perceptions of catfish and on the frequency of their catfish purchases, both at-home and in restaurants. Cross-sectional survey data on 2,172 households, collected during the spring of 1988, were used to estimate the eight-equation behavioral model. Model results indicated that "the ad campaign in its first year increased consumers' awareness of farm-raised catfish 15%, improved consumers' perceptions of product attributes ... and overall attitudes toward catfish 2%-4%, and increased purchase frequencies for at-home and restaurant consumption 11%-12%." A farm-level profit

equation was specified and utilized to assess returns to producers from the advertising effort. Depending on the magnitudes of demand shift and supply elasticity assumed, the authors estimated net producers' surplus to be from \$0.48 to \$7.46 per dollar spent on media advertising. The authors concluded that, given sufficient funds, opportunities exist to increase the effectiveness of the program by altering the catfish attributes emphasized in the ad copy and re-targeting the ads. They suggest that a mandatory program is needed to overcome the free-rider problem, and that this will have the added benefit of providing more money for promotional activities.

Kullman, D. 1983. *Generic Advertising of Dairy Products in the United States: How Effective are the Various Programs and Why is Japan Interested in Them*. A.E. Extension Paper 83-21, pp. 77-88. Cornell University, Ithaca, NY. Successful U.S. generic dairy promotion programs in St. Louis and California are examined and compared to Japanese practices. It was found that for every \$1 spent in 1981 for generic milk advertising in the U.S., \$49 was spent advertising other beverages (including alcohol). The California Milk Advisory Board (CMAB) also determined that milk was perceived as a "high energy" drink, not in competition with soft drinks, high in fat and calories, and not something to be consumed socially. Japan's dairy program has resulted in high production per cow, but low consumption. In response, one Japanese province of 5.5 million spent \$1.62 per capita in 1979-80 on generic milk promotion (\$0.21 per cwt.).

Lambin, J.J. 1975. *What is the Real Impact of Advertising?* Harvard Business Review, 53(3):139-147. Based on annual European advertising and sales data for 16 consumer items, elasticity of demand was estimated to be less than 0.5 for all products. Two-thirds of the products studied had significant degrees of brand loyalty, but this was not strongly correlated with advertising intensity. Advertising was also not found to overcome price or quality differentiations, nor did it decrease corporate rivalry. In markets with high levels of advertising, price consciousness was lowered, however. Examining 35 brands in particular, only 21 were found to have marginal returns to advertising greater than 1.0. Overall, advertising was found to have little effect on primary demand, yet was also not seen as a major contributor to market concentration.

Lee, J. 1981. *Generic Advertising, FOB Price Promotion, and FOB Revenue: A Case Study of the Florida Grapefruit Juice Industry*. Southern Journal of Agricultural Economics, 13(2):69-78. Using data from 1971-78, a six-equation system was modeled to estimate the impact of generic advertising and price adjustments on Florida grapefruit processors' revenues. In the wholesale-pricing equation, the FOB price was negatively related to the USDA crop forecasts and to inventory size. An increase in per capita retail demand of one ounce increased juice movement by 2.75 million gallons (single-strength), while each one cent change in FOB price affected retail prices by 1.25 cents. Generic advertising was determined to be most effective in the quarter it appeared. During 1970-78, \$11.83 million was spent on generic grapefruit advertising resulting in \$123.41 million in net profits due to advertising, a \$10.44 return per dollar spent.

Lee, J.Y. 1983. *Florida Department of Citrus Advertising Research Programs*. North Central Regional Research Publication 287. N.C. Project 117. Monograph 14, pp. 179-200. College of Agriculture and Life Science, Research Division, University of Wisconsin, Madison, WI. A review of previous advertising studies is included along with an updated estimation of generic grapefruit

promotion. The improvements to the original model include adding chilled and frozen juice sales, examining advertising decay, use of quarterly rather than annual data, and the inclusion of juice supply. It was concluded that generic advertising increased FOB grapefruit juice movements and FOB prices and was most effective during the quarter it occurred, with a carry-over period of three quarters. Net return for each dollar spent on generic advertising was estimated to be \$10.44.

Lee, J.Y. and M.G. Brown. 1986. *Economic Effectiveness of Brand Advertising Programs for United States Orange Juice in the European Market: An Error Components Analysis*. *Journal of Agricultural Economics*, 37(3):385-394. Using data from 1973-82, U.S. orange juice imports by 13 European countries were studied in relation to U.S. and Brazilian orange juice prices, currency rates, and promotion expenditures by the European three-party program. The advertising coefficient was positive and statistically significant, indicating the promotion program increased demand for U.S. juice. The average return for each dollar spent by the three parties (FAS, Florida Department of Citrus, and European distributors) was estimated to be \$5.51. It was found that demand was more sensitive to a drop in U.S. prices than Brazilian prices, and it was estimated that to achieve the same increase in sales through price reductions would have been two to five times more expensive, depending on the year.

Lee, J.Y., M.G. Brown, and G.F. Fairchild. 1989. *Some Observations on the Impact of Advertising on Demand*. *Agribusiness*, 5(6):607-618. This article discusses limitations of using a single equation with a distributed-lag structure to determine advertising's effects on demand. These limitations include missing advertising's effects on related products (complementarity and substitutionality) and differences between brand and generic advertising that can confound results if not separated and identified. Outlines for research needed include both evaluation of specific promotion programs and determination of the overall impact of commodity advertising on consumers and on national agricultural policy. To this end is provided a brief history of advertising evaluation, theories of advertising decay, demand restrictions, and model specifications including advertising.

Lee, J.Y. and G.F. Fairchild. 1988. *Commodity Advertising, Imports, and the Free Rider Problem*. *Journal of Food Distribution Research*, 19(2):36-42. Data from 1978-86 were used with three-stage least squares to estimate Florida's free-rider problem for their generic orange juice advertising. It was determined that an increase in demand would stimulate sales of Florida juice, but would have a stronger effect on sales of imported (Brazilian) juice. If annual generic advertising was increased by \$1 million, total demand was estimated to increase by 30 gallons per 1,000 persons, with 46% of the increase going to the Florida market. However, due to the higher value of Florida juice, Florida producers would still benefit more from the increased advertising than the importers, with each additional dollar bringing in \$2.28.

Lee, J.Y., L.H. Myers, and F. Forsee. 1979. *Economic Effectiveness of Brand Advertising Programs of Florida Orange Juice in European Markets*. Florida Department of Citrus ERD Report 79-1. Gainesville, FL. 46 pp. A double-logarithmic equation was used to estimate per capita orange juice exports to ten European countries. It was estimated that 23% of the total orange juice exports during 1976 and 1977 was due to the advertising program. To have an equal impact by reducing prices would have cost 3.9 times as much. For each dollar spent in advertising, \$11.50 was returned from Sweden and \$8.00 from Norway while less

than \$1.00 was returned from France and Austria. Total returns from the exports always exceeded Florida's share of the advertising expenditures, however, with a net return of \$6.62 million during 1976 and 1977. Between 1972-77 the program increased Florida net revenues by over \$40 million (shared among all growers).

Lenz, J., O. Forker, and S. Hurst. 1991. *U.S. Commodity Promotion Organizations: Objectives, Activities, and Evaluation Methods*. A.E. Research 91-4. Department of Agricultural Economics, Cornell University, Ithaca, NY. 35 pp. A survey of U.S. commodity promotion organizations was conducted during the summer of 1990. The 116 organizations that responded had a total staff of 2,017 and invested over \$750 million in programs and administration in 1990. The responses indicated that producer boards of directors are very involved in formulating program objectives. Respondents placed a high priority on increasing aggregate commodity sales and on maximizing producer net returns. They use a variety of strategies and means to achieve their objectives, and also use a variety of evaluation methods. This report discusses in detail the relationships among objectives, activities, and evaluation methods. The responses lead to a conclusion that those organizations that combine econometric analysis with a mix of other evaluation measures are likely to have a more comprehensive understanding of the role that their promotion programs play in changing consumer beliefs and attitudes, and subsequently, purchasing behavior.

Lewandowski, R. and D. Rojek. 1991. *Simulation Model of Strategies for the Butter Market: The Butter Market in France, Preliminary Analysis*. 35 pp. Quarterly data from 1985-1990 were used to estimate the effects of seven explanatory variables on butter consumption in France to determine the long-term trend. The seven variables were brand advertising, generic advertising, own-price, prices of substitutes, seasonal temperatures, Christmas, and all other effects. Using these variables with the MARKET method (an extended asymmetrical logistic function of the "bonus" type), predicting ability was 99%. Six simulations were also estimated for 1991-92 based on these data.

Liu, D.J. and O.D. Forker. 1988. *Generic Fluid Milk Advertising, Demand Expansion, and Supply Response: The Case of New York City*. *American Journal of Agricultural Economics*, 70(2):229-236. A demand equation was estimated with data from 1971-84 using a transfer function distributed-lag model with nonlinear least squares to determine the effectiveness of generic advertising in increasing fluid milk consumption. The advertising variable was significant, indicating that advertising was effective. The equation was then used to determine the optimal level of advertising and the current rate of return from fluid milk advertising. It was determined that advertising expenditures were approximately 35% greater than optimal, but the rate of return to dairy farmers was estimated at 150%. A dynamic supply model indicated the effect on milk supply by advertising was negligible.

Liu, D.J., H.M. Kaiser, O.D. Forker, and T.D. Mount. 1989. *The Economic Implications of the U.S. Generic Dairy Advertising Program: An Industry Model Approach*. *Northeastern Journal of Agricultural and Resource Economics*, 19(1):37-48. A dairy industry model was estimated to determine the effects of generic advertising on prices and supply using wholesale and retail components for both fluid milk and for manufactured dairy products as well as a farm-level component. A simultaneous switching procedure was used to account for the influence of the government price support program. Compared to a base scenario of no generic advertising, historical levels of fluid advertising alone were estimated to increase retail fluid sales by 2.74%, while manufactured sales increased 0.99%

under historical levels of manufactured-product advertising alone. When these levels of fluid and manufactured advertising were combined, fluid and manufactured sales increased 2.67% and 0.85%, respectively. Rates of return to farmers were estimated at \$7.04 for fluid-only advertising and \$4.77 for fluid and manufactured. There was no increase in return for the manufactured-only scenario as commercial sales were offset by decreases in government purchases.

Liu, D.J. and O.D. Forker. 1990. *Optimal Control of Generic Fluid Milk Advertising Expenditures*. *American Journal of Agricultural Economics*, 72(4):1048-1055. Optimal expenditures of the New York State milk promotion program are determined for three markets. Spending levels in New York City and Albany should be reduced by about 10%, while that for Syracuse should be increased three times. Further, there exists an optimal seasonal advertising pattern that reflects the seasonal pattern of the Class I differential. In addition, the optimal spending level and seasonal pattern of the state promotion program depends on those of the national program. Thus, coordination between the two promotional units is essential to achieve optimality.

McClelland, E.L., L. Polopolus, and L.H. Myers. 1971. *Optimal Allocation of Generic Advertising Budget*. *American Journal of Agricultural Economics*, 53(4):565-572. A quadratic model was estimated with data from 1960-67 to determine the optimal allocation of generic promotion funds for six citrus products in nine markets. Of the 54 product-region equations, 35 met the necessary and sufficient conditions and also explained a statistically significant amount of variation in consumer sales (95% level). Using unconstrained advertising budgets, it was estimated that \$4.36 million should be spent on processed citrus advertising annually and \$2.45 million on fresh citrus, compared to actual average expenditures of \$1.73 million for processed citrus and \$0.56 million for fresh. Theoretically, optimal advertising in 1966-67 could have generated an additional \$21 million in consumer sales.

McGuinness, T. and K. Cowling. 1975. *Advertising and the Aggregate Demand for Cigarettes*. *European Economic Review*, 6(3):311-328. Two equations were estimated, one with a constant elasticity (log-linear form), and the other specifying own-price elasticity as a function of the own-price level to determine the effect of advertising on demand for cigarettes. Both forms had similar results, with the long-run advertising elasticity with respect to sales decreasing from 0.2846 prior to publication of health reports on smoking to 0.1971 after the reports were published. Price elasticity was estimated as -1.045 and income elasticity as 0.330. Advertising was found to be a significant factor in sales, with advertising increasing after the publication of the adverse health reports, particularly for filtered cigarettes.

Measurement for Management, Ltd. 1986. *A Quantitative Analysis of the Liquid Milk Market in England and Wales and the Impact of Generic Advertising*. (Unpublished). Using monthly market data, models were built to explore the relationship between generic milk promotion and liquid milk sales. An own-price elasticity of -0.11 was estimated along with an income elasticity of 0.14 and a generic advertising elasticity of 0.0117. Other factors explored included the influence of health concerns and the proportion of children on consumption levels. The study concluded that a small increase in generic advertising spending was warranted to result in an optimum level of spending. Diminishing returns to advertising were estimated. The availability of milk and particularly low-fat milks was also demonstrated to impact on overall sales volumes.

Measurement for Management, Ltd. 1988. *A Quantitative Analysis of the Cheese Market in England and Wales and the Impact of Generic Advertising*. (Unpublished). Using multiple-regression techniques, models were built to explore the relationship between advertising and household purchases of cheese in the England and Wales market. An own-price elasticity of -0.14 is estimated along with an income elasticity of 0.23. Health concerns and the propensity to use packed lunches are also shown to influence demand for cheese. The advertising elasticity is calculated at 0.008, very small. The market is dominated by branded advertising (75%), and it seems that this, rather than generic advertising, has been responsible for the very modest increase in sales due to advertising.

Meissner, F. 1961. *Sales and Advertising of Lettuce*. *Journal of Advertising Research*, 1(3):1-10. Regression analysis was used with sales and advertising data from 1950-55 to determine the effectiveness of a California generic lettuce promotion program. Advertising was further desegregated into spot radio, network radio, television, fieldmen, wholesalers, retailers, direct mail, and newspapers. Statistically significant variables were price, temperature, fieldmen, and newspaper advertising with an R^2 of .66. Results indicated that the promotion program increased lettuce consumption by 8.8 carlots per 100,000 population. Further analysis by classifying the data chronologically was suggested to determine at what point the advertising shifted the demand curve.

Morrill, J.E. 1970. *Industrial Advertising Pays Off*. *Harvard Business Review*, 48(2):4-14 & 159-169. Data from 26 studies and 100,000 telephone interviews were used to draw overall conclusions about the effectiveness of industrial advertising based on exposure to advertising in trade publications. It was found that selling to the exposed group was cheaper (including advertising costs) due to increased familiarity with the product. It also cost companies that did no advertising more to sell to the exposed group as they had to overcome the influence of the competitors' advertising. A minimum threshold of five pages of advertising annually was estimated as necessary to influence buyers. Advertising was found to be most effective when backed up by sales calls by manufacturers and distributors and limited to one or two product lines at a time in a few publications.

Morrison, R.M. 1984. *Generic Advertising of Farm Products*. *Agricultural Information Bulletin 481*. USDA, Washington, DC. 15 pp. In 1982, producers in 43 commodity groups spent over \$100 million on state and federal generic promotion programs, which was still less than 3% of the money spent on brand advertising that year. This paper covers many general aspects of commodity promotion, including reasons for generic advertising, the free-rider problem, differences between research and promotion acts and marketing orders, the USDA's overseas marketing programs, and measuring the effectiveness of generic advertising, including a discussion of lags and the problems of diminishing returns. Advantages and disadvantages of generic advertising on consumers are mentioned, as well as the difficulties of increasing prices through advertising without first limiting supply.

Nelson, P. 1974. *Advertising as Information*. *Journal of Political Economy*, 82(4):729-754. In advertising, "search" qualities are defined as those that can be determined before purchase, while goods must be first purchased and used to find the "experience" qualities. An equation to determine revenues from "search" and "experience" advertising was estimated. When tested on "search"

(i.e., clothing) and "experience" (i.e., food products) goods, statistically significant differences were found in the number of advertisements for the two classes of goods. It was found that "experience" advertising is concentrated on nondurables, with "search" advertising used for durables. It was also determined that deceptive advertising is primarily involved with "experience" qualities, which cannot be determined by a consumer without purchase or sampling of a good.

Nelson, P. 1978. *Advertising as Information Once More*. In *Issues in Advertising: The Economics of Persuasion*, D.G. Tureck, ed., pp. 133-160. American Enterprise Institute for Public Policy Research, Washington, DC. To prove the theory that all advertising is strictly information, advertising returns to scale, concentration ratios, advertising by multibrand firms, and market characteristics are each examined empirically. Of particular interest is the derivation of advertising elasticities of demand. These are based on 1957 IRS data for 42 IRS industry categories and are derived by multiplying estimated price elasticities by the advertising/sales ratio for each category. Advertising elasticities for food and beverage categories were estimated as follows: beer, 0.30; cereals, 0.21; confectionery, 0.16; dairy products, 0.08; grain products, 0.07; meats, 0.03; miscellaneous foods, 0.18; sugar, 0.01; and wine at 0.19.

Nerlove, M. and K.J. Arrow. 1962. *Optimal Advertising Policy Under Dynamic Conditions*. *Economica*, 29(114):129-142. The Dorfman-Steiner model was used to determine the effect of advertising on future product demand. Quantity demanded was assumed to be a function of price, advertising, and other factors (income, population, substitute and complement prices, etc.). Marginal production costs were equated to marginal gross revenues to determine an optimal pricing policy. Optimal advertising policy was determined using a net profit function, with advertising goodwill treated as a capital investment, assuming a constant rate of depreciation. Both the advertising and pricing policies became stationary after a certain point. A more specific case with demand as linear in logarithms and linear total costs was also derived.

Nerlove, M. and F.V. Waugh. 1961. *Advertising Without Supply Control: Some Implications of a Study of the Advertising of Oranges*. *Journal of Farm Economics*, 43(4):813-837. Static supply and demand models were estimated to determine the long-run effects of generic advertising on the orange industry using annual data from 1907-59. The model was fitted as an exponential function with decreasing returns to advertising and resulted in an R^2 of .85. Price elasticity of demand was estimated to be -0.72, income elasticity 0.67, and the long-run advertising elasticity 0.24. While benefits of advertising were found to outweigh costs in the short run, no account was taken of long-run effects on production. Also, marginal returns to advertising were found to decrease rapidly with increasing expenditures. Assuming all things constant, it was estimated that each dollar spent on generic orange advertising in the early 1960s would return \$20 to growers.

Nichols, J.P. 1990. *The Effects of Generic Promotion for Agricultural Products in Export Markets*. *Economie & Gestion Agro-Alimentaire*, 16(July):33-39. An overview of current generic commodity promotion, this article focuses on changes in recent years and the increasing potential for export programs. Included are brief sections on international markets, factors affecting exports, the role of government involvement, various organizational structures of export programs, discussions on promotion program activities, levels of management, program effectiveness and its measurement, and examples of current export promotion programs and their implications. These case studies include Florida's

European citrus cooperator program, the U.S. soybean cooperator program, promotion of Australian wool in the U.S., and promotion of U.S. bread products in Korea during the 1988 Olympics.

Nichols, J.P., H.W. Kinnucan, and K.Z. Ackerman, eds. 1991. *Economic Effects of Generic Promotion Programs for Agricultural Exports*. Texas A&M University, College Station, TX. 200 pp. This collection of papers is divided into five basic headings: (1) "Generic Promotion Overview," (2) "Organizational Needs and Objectives for Evaluation," (3) "Conceptual Issues, Data and Research Methods," (4) "Evaluation of Case Studies," and (5) "Directions for the Future," with each examining some facet of commodity promotion through agricultural exports. Program evaluation is the primary theme of the conference, with 10 of the 18 papers focusing on this key topic. The case studies of commodity export programs include cotton, citrus, wheat, and dry peas, as well as a paper discussing the implementation of a dairy check-off promotion program in Korea.

Olson, M. 1971. *The Logic of Collective Action: Public Goods and the Theory of Groups*. Harvard University Press, MA. This book deals with groups, why they exist, who benefits, theories of state and class, and particular types of groups. It is assumed that all groups must further the common needs of their members or they would disband. Group theory also suggests that smaller groups are more efficient at optimizing benefits for their members than large groups. Small groups work more efficiently, result in more accomplishments, and are longer-lived. Large groups must require people to join (or pay dues) to avoid the free-rider problem. Also, in any group, those most able to obtain goods will be exploited by those less able. To optimize benefits for the group as a whole, the marginal cost for each member must be equated to the proportion of the marginal benefits each receives.

Powers, N.J. 1989. *A Study of Demand Response to Grocery Advertising of Fresh California-Arizona Navel Oranges*. *Agribusiness*, 5(5):423-435. Two-stage least squares was used with a grocers' advertising index for New York City, Chicago, and Los Angeles to estimate advertising's effect on demand for navel oranges from 1982-85. Because of the media used for the advertising (weekly circulars or flyers), the advertising carry-over was estimated to last only about a week, with 95% of the increased demand occurring in that week. This is a much shorter carry-over period than for other types of either generic or brand advertising and is due almost entirely to the short-term cycles of this type of advertising. If both shipments of navel oranges and advertising levels were at median levels, total advertising elasticity for the two-week period was 0.205, compared to an own-price elasticity at these levels of -0.768.

Primeaux, W.J., Jr. 1981. *An Assessment of the Effect of Competition on Advertising Intensity*. *Economic Inquiry*, 19(4):613-625. To determine if differences in market structure affect intensity of advertising, OLS regression analysis was used with utility company data from 1948-1968. Twenty-one companies were in monopoly situations, while 13 faced direct competition from privately owned electric companies. It was determined that advertising was the same for monopolies and competitive firms when both had zero growth rates. Only with growth did competitive firms increase their advertising relative to monopolies. Beyond a level of 17,560 residential customers, monopolies actually spent more on advertising than competitive firms. In all cases, though, electricity rates were lower by 16% to 19% in cities with competing firms.

Quilkey, J.J. 1986. *Promotion of Primary Products - A View From the Cloister*. *Australian Journal of Agricultural Economics*, 30(1):38-52. The focus of this paper lies in using price and income elasticities to measure and evaluate the effects of promotion. Promotion is first defined as an attempt to alter consumers' perception of their incomes and product prices in order to encourage budget sales. It is then postulated that promotion affects budget shares, and elasticities occur through improvements in consumer knowledge. Five equations for profit maximization are described--pricing, promotion, quality-variation, marketing mix, and supply--along with their shortcomings. Also mentioned was the importance of including promotion's effect on supply, particularly when considering generic promotion.

Rausser, G.C. and E. Hochman. 1979. *Deterministic Control Formulation of Advertising Policies: The Case of the Florida Department of Citrus*. In *Dynamic Agricultural Systems: Economic Prediction and Control*, pp. 59-73. North Holland, Inc., New York, NY. This chapter uses principles presented earlier in the text to determine an optimal marketing and promotion formulation using Florida citrus data from 1967-72. A sales-response model incorporating advertising effect, decay and carry-over, and market saturation is specified using OLS. This is estimated with and without seasonality. In each case, optimal sales and advertising were found to be \$134 million and \$4.1 million per quarter, respectively, with both requiring 22 months to converge to optimum assuming \$25 million in initial sales. Comparing net present value of actual sales and advertising expenditures over the same time period, it was calculated that the Florida citrus producers could have gained an additional \$71.1 million had they increased their advertising to the optimal levels.

Resurreccion, A.V.A. and B.P. Klein, eds. 1988. *Symposium Proceedings on Applications of Multivariate Methods in Sensory and Consumer Research*. *Food Technology*, 42(11):118-156. Six papers are presented: "Multivariate Sensory Analysis," "Uses of Multivariate Methods in Screening and Training Sensory Panelists," "Applications of Multivariate Methods in Food Quality Evaluation," "Marketing and Cost Factors in Product Optimization," "Multivariate Analyses and Measurement of Consumer Attitudes and Perceptions," and "Applications of Multivariate Methods in Strategic Approaches to Product Marketing and Promotion." Overall, this publication is a good review of multivariate methods, particularly in regard to their uses in food and beverage marketing.

Roberts, I. and G. Love. 1989. *Some International Effects of the U.S. Export Enhancement Program*. *Agriculture and Resources Quarterly*, 1(2):170-181. The 1985 U.S. Export Enhancement Program was designed to increase commodity exports (particularly against EC competition) by lowering prices for specific "target" markets. It has been used primarily to market wheat, with 65% of U.S. wheat exports in 1988 covered by the program. Using data from 1987-88, a model was estimated to determine the effect of this program on Australian wheat exports. It was estimated that the U.S. program cost Australian wheat exporters between \$150 million to \$200 million in 1987 through price discrimination, and reduced Australian wheat production by one million tons. On the other hand, EC grain exports have remained strong, despite the increased competition.

Rozek, R.P. 1982. *Brand Identification and Advertising: The Case of a Generic Trademark*. *Applied Economics*, 14(3):235-248. A discussion of trademarks (and brand names) and reasons behind their effectiveness includes trademarks as generic terms (i.e., Jello, Kleenex) and as barriers to entry for new firms. An advertising model simulating a market with passive buyers influenced only by

sellers and their trademarks is then specified to estimate an optimum number of advertising messages. The result is equilibrium, with each seller sending the same number of messages. This optimal number is directly related to product price and the number of buyers, and inversely related to advertising and production costs. The seller will continue to advertise as long as excess profit would occur in the seller's absence, and until the marginal revenue of that last advertising unit equals its cost.

Schotzko, R.T., W.W. Wilson, and D. Swanson. 1989. *Demand for Washington Fresh Sweet Cherries*. Research Bulletin XB1007. College of Agriculture and Home Economics Research Center, Washington State University, Pullman, WA. Seemingly unrelated regression analysis was used with annual data from 1948-85 to estimate the price functions for Northwest and California fresh sweet cherries. A dummy variable was used to represent the Washington State market order for cherries, which began in 1958; however, this variable was not found to be statistically significant. It was determined that each one-ton increase in Northwest cherry supplies decreased grower returns by \$0.64 per ton, while a one-ton increase in California production decreases returns in the Northwest by \$0.32 per ton. This is consistent with the trend since the 1960s of continued sales increases but with a decline in real prices of 30%.

Schultz, R.L. and D.R. Wittink. 1976. *The Measurement of Industry Advertising Effects*. Journal of Marketing Research, 13(1):71-75. The article begins by defining primary (generic), selective (brand), and competitive advertising. This is followed by an overview of discrimination models that are used when measuring the effects of various combinations of advertising types. Three previously estimated discrimination models are examined: a naive model comparing changes in sales to changes in advertising; the "Clarke" model, which uses advertising elasticities for sales and market share to determine the primary demand elasticity; and the "Bass and Parsons" model, using a system of simultaneous equations to determine industry advertising effects. No actual estimations are shown here, only theoretical frameworks.

Seitzinger, H.A. and P.L. Paarlberg. 1989. *A Survey of Theoretical and Empirical Literature Related to Export Assistance*. Staff Report AGES 89-34. Economic Research Service, Commodity Economics Division, USDA, Washington, DC. 32 pp. Global export assistance (GEA) is modeled under three assumptions: first, treating the assistance as a price subsidy; second, as a transfer of free food; and third, as payment-in-kind. Several empirical analyses of GEA programs are also reported. The second major topic is targeted export assistance (TEA). Here again a cash or price subsidy is modeled first under several different income-effects scenarios as well as under the assumption of imperfect competition. This is followed by an analysis of targeted food aid programs. Lastly, several empirical studies of TEA are summarized. Overall, it was concluded that global export assistance is generally welfare-reducing while targeted export assistance may benefit exporters, although usually only slightly and with trade disruptions.

Seldon, B.J. and K. Doroodian. 1989. *A Simultaneous Model of Cigarette Advertising: Effects on Demand and Industry Response to Public Policy*. Review of Economics and Statistics, 71(4):673-677. A simultaneous advertising and demand equation was estimated using data from 1952-84 with nonlinear three-stage least squares. Own-price elasticity was estimated to be -0.4, income elasticity 0.27, and habit persistence was estimated at 0.6. Dummy variables were used to account for policy changes in cigarette advertising over time. Over the length

of the study, advertising elasticities were significantly positive but declining, ranging from 0.25 (1952-63) to 0.09 (1979-84). Coefficients on dummies used to determine the effects of health warnings were also positive, indicating increased advertising to combat the negative effects. However, a net reduction in advertising expenditures was found when TV and radio advertising were prohibited in 1971.

Sethi, S.P. 1977. *Dynamic Optimal Control Models in Advertising: A Survey*. *SIAM Review*, 19(4):685-725. Four types of optimal control advertising models were examined: (1) advertising capital, (2) sales-advertising response, (3) micro models, and (4) control-theoretic empirical. An example of advertising-capital models is the Nerlove-Arrow model that uses a "stock" of goodwill to explain the effects of current and past advertising expenditures, while sales-advertising response models incorporate the carry-over effects of advertising. Micro models include diffusion models, dynamic adjustment models, and persuasive advertising models. Adding an investment function to Nerlove and Arrow's profit-maximizing model through a stock-adjustment variable is an example of an empirical optimal-control model. Distributed lags are used to explain variations in the stock of goodwill as advertising expenditures fluctuate.

Simon, J.L. and J. Arndt. 1980. *The Shape of the Advertising Response Function*. *Journal of Advertising Research*, 20(4):11-28. Two advertising function shapes were theorized: concave-downward (implying monotonically diminishing returns) and an s-shaped curve (initially increasing returns followed by decreasing returns). One hundred experiments and studies were examined to determine the shape indicated for the physical advertising response function. Each demonstrated diminishing returns to all independent variables, indicating the concave-downward shaped curve. For the monetary advertising response function it was theorized that quantity discounts could lead to increasing returns. However, studies of time-series and cross-sectional data (and many functional forms) again resulted in a general consensus for a downward-sloping concave monetary advertising response function.

Smith, D.T., ed. 1988. *Marketing U.S. Agriculture, 1988 Yearbook of Agriculture*. U.S. Government Printing Office:1988 0-187-237:Q12, Washington, DC. 326 pp. This compilation of 65 informative and interesting articles is produced by a variety of authors and is entirely devoted to food and commodity marketing. The segments range from broad-based commentary such as "Food Marketing Industry Responds to Social Forces" by Alden Manchester from the USDA, ERS, to more specific topics by industry specialists (i.e., "Turkey Anytime" by Barbara Schuelke from Oscar Mayer Food Corporation). The text itself is divided into seven sections, each with a self-explanatory title: (1) "Marketing in a Changing World," (2) "Marketing Strategies," (3) "Discovering What Buyers Want," (4) "New or Better Products to Meet Demand," (5) "Delivering Quality Goods," (6) "Promoting Agricultural Products," and (7) "Where to Get More Marketing Information."

Specialist Research Unit, Ltd. 1985. *European Dairy Task Force*. EEC, Brussels. (Unpublished). A variety of models were built for liquid milk, cheese, butter, cream, and yogurt in selected EC countries. For milk, price elasticities ranged from -0.22 to -0.57; cheese, -0.44 to -0.64; butter, -0.13 to -1.27; cream, -1.44; and yogurt, -0.47 to -1.74. Advertising elasticities were found for milk, 0.05 to 0.014; cheese, 0.01 to 0.26; butter, 0.006 to 0.56; and yogurt, 0.11 to 0.21. The study concluded that generic advertising was

effective in raising demand for liquid milk and butter. For cheese and yogurt it was not possible to isolate a generic effect.

Stavins, R. and O.D. Forker. 1979. *Dairy Promotion in the United States, 1963-1979*. A.E. Research 79-17. Department of Agricultural Economics, Cornell University, Ithaca, NY. 262 pp. A comprehensive history of the promotion of dairy products in the United States with special reference to the New York State program for the period 1963 through 1979.

Strak, J. 1983. *Optimal Advertising Decisions for Farmers and Food Processors*. *Journal of Agricultural Economics*, 34(3):303-315. This paper reviews some advertising decision models that are appropriate for food producers and processors. The returns from advertising to farmers, the trade, and government are examined for the examples of liquid milk, cream, and English butter. The analysis demonstrates that any conclusions will be sensitive to different assumptions about key parameters in the theoretical framework used. More generally, prescriptive work in this area may be overly dependent on the use of elasticities and it may be better to develop a model that utilizes the response of sales to advertising directly.

Strak, J. and L. Gill. 1983. *An Economic and Statistical Analysis of Advertising in the Market for Milk and Dairy Products in the U.K.* University of Manchester. *Journal of Agricultural Economics*, 34(September). Models were built using multiple-regression techniques to explore the impact of advertising on the markets for liquid milk, cream, butter, and cheese in the United Kingdom. Price and income elasticities were also estimated. Generic advertising elasticities for liquid milk (0.036) and cream (0.029) were estimated. Price elasticities of -0.21 (liquid milk) and -0.81 (cream) were found. Although an overall advertising effect was found for butter (0.0343), no generic effect was isolated. For cheese, generic advertising effects were estimated both for the total market (0.133) and the Cheddar cheese subsector (0.030). Optimal advertising budgets were constructed under various assumptions concerning product profitability. For liquid milk it was concluded that the generic advertising spending was sub-optimal and could be expanded to the benefit of milk producers, processors, and the government. For cream, generic advertising spending, though effective, was shown to be noneconomic and in excess of optimum levels.

Strak, J. and M. Ness. 1978. *A Study of Generic Advertising in the U.K. Egg Industry, 1971-1976*. Bulletin 165/EC69. Department Agricultural Economics, University of Manchester, England. The primary objective was to determine the optimal expenditure level for U.K. generic egg advertising. The "best" equation was in double-log form with an unconstrained distributed lag of three months (R^2 of .42 and Durbin-Watson of 1.54). Long-run elasticity of demand with respect to advertising was 0.01, with price elasticity of demand estimated to be -0.1. Assuming a price elasticity of supply of between +2.0 to +0.6, optimal advertising to sales ratios were estimated as 0.43 to 1.20. Actual advertising to sales ratios ranged from 0.44 in 1973 to 0.40 in 1977 (the low end of the "optimal" range). Assuming elasticity of supply to be +0.5, each additional British pound spent on advertising would generate an additional ten pounds from increased sales.

Tauer, J.R. and O.D. Forker. 1987. *Dairy Promotion in the United States, 1979-1986*. A.E. Research 87-5. Department of Agricultural Economics, Cornell University, Ithaca, NY. 314 pp. A comprehensive reference work, this publication covers the following: "Review of Dairy Promotion Programs and

Funding Methods, 1915-1979," "National Dairy Promotion and Research Board," "United Dairy Industry Association," "Dairy Promotion Federation Association," "The New York State Dairy Promotion Program, 1978-1986," "State or Regional Dairy Promotion Organizations and Institutions funded by New York Producers," "American Dairy Association and Dairy Council, Inc. Advertising and Promotion Programs, 1979-1986," "Wisconsin Milk Marketing Board," "The Far West: California, Oregon, and Washington," "Advertising and Promotion Agencies Under Federal Milk Marketing Orders," "Review of Research Directed Toward the Evaluation of Dairy Promotion Programs, 1979-1986," and "The Dairy Promotion Effort in Perspective."

Thompson, S.R. 1974. *Sales Response to Generic Promotion Efforts and Some Implications of Milk Advertising on Economic Surplus*. Journal of the Northeastern Agricultural Economics Council, 3(2):78-90. Geometric and polynomial lag models were estimated using California milk sales and advertising data from 1970-73. Using the advertising effect from the polynomial model and estimated demand and supply elasticities (-0.30 and 1.5, respectively), changes in net consumer and producer welfare due to advertising were determined (under supply and demand equilibrium). Based on the average per capita advertising expenditures in 1972 (\$0.17), welfare was estimated to have increased by \$70.8 million (net of advertising costs). If advertising had decreased to \$0.10 per capita, net welfare would have still increased by \$41.5 million, but if advertising had increased to \$0.30 per capita, net welfare would have risen to \$128.5 million (through shifts in the demand schedule).

Thompson, S.R. 1979. *The Response of Milk Sales to Generic Advertising and Producer Returns in the Rochester, New York Market*. A.E. Staff Paper 79-26. Department of Agricultural Economics, Cornell University, Ithaca, NY. 14 pp. Using data from 1975-78, a finite distributed-lag equation was used to estimate Class I fluid milk sales in Rochester, NY. Price elasticity of demand was estimated to be -0.36, income elasticity 0.34, and the cross elasticity for soft drinks was 0.2. Long-run advertising elasticity of demand was estimated to be 0.0149. A gain of 3.4% in per capita fluid milk sales (125 ounces) was attributed to generic advertising in 1978. Farm value of this increase was estimated to be \$0.208 (assuming no supply response and a Class I-Class II differential of \$2.47 per cwt.) and per capita advertising expenditures were \$0.145, resulting in a per capita average net return to producers of \$0.063 for 1978. As returns were larger than expenditures, generic advertising was determined to be cost-effective.

Thompson, S.R. and D.A. Eiler. 1975. *A Multivariate Probit Analysis of Advertising Awareness on Milk Use*. Canadian Journal of Agricultural Economics, 23(1):65-73. Based on beverage consumption data from telephone interviews of 3,011 individuals in three New York markets, a Probit model was estimated to determine the probability of milk use. Age and sex were both significant variables, with older people and women having lower probabilities of milk consumption. Income was not significant, but alcohol, coffee, and soft-drink consumption were. All related negatively to the probability of milk consumption. Consumption of orange juice was positively related, increasing the probability of milk consumption. Blacks were found to consistently drink less milk than whites, but no pattern was found among the Hispanic respondents. While advertising awareness was positively related to milk consumption in all markets, it was not statistically significant.

Thompson, S.R. and D.A. Eiler. 1975. *Producer Returns from Increased Milk Advertising*. American Journal of Agricultural Economics, 57(3):505-508. A

second-degree polynomial lag model was estimated to determine the short- and long-run effects of generic fluid milk advertising on sales. Using data from 1971-74, an equation was estimated for each of the New York City, Albany, and Syracuse SMSAs. The New York City equation yielded an own-price elasticity of -0.185, income elasticity of 0.285 (not significant), and an estimated increase in total fluid milk sales of 1.93 ounces per capita for each \$0.01 increase in monthly per capita advertising. The estimated value to the farmer of each ounce increase in fluid milk sales was \$0.0016. Producer returns (over the cost of advertising) were estimated to be \$0.105 in New York City, \$0.028 in Albany, and \$-0.038 in Syracuse (per capita).

Thompson, S.R. and D.A. Eiler. 1977. *Determinants of Milk Advertising Effectiveness*. *American Journal of Agricultural Economics*, 59(2):330-335. To determine the effect of generic fluid milk advertising on the blend price, a polynomial-lag function was estimated using OLS. The adjusted R^2 was .97, and the combined elasticity of advertising (direct and carryover) was estimated at 0.0212. Generic advertising was found to positively affect sales and the blend price. A generic advertising program with deflated per capita expenditures of \$0.00575 would cost \$0.045 per cwt. Thus, any Class I-Class II differential greater than \$1.40, combined with a Class I utilization rate of 50% or greater, would yield positive returns to producers. Large differentials, high utilization rates, and low price elasticity of supply characterize the most effective markets for generic fluid milk advertising.

Thompson, S.R., D.A. Eiler, and O.D. Forker. 1976. *An Econometric Analysis of Sales Response to Generic Fluid Milk Advertising in New York State*. *SEARCH*, 6(3):1-24. Using data from three New York markets in 1971-74, econometric analysis was performed to determine optimal levels of generic dairy advertising and the return on investment. Distributed lag models with a finite lag length were estimated using the Almon procedure. When per capita advertising expenditures increased from \$0.025 to \$0.07, due to the enactment of the New York State Dairy Promotion Order, per capita fluid milk sales increased by 94, 46, and 13 ounces in New York City, Albany, and Syracuse, respectively. Net producer returns for the three markets were \$.104, \$.028, and -\$0.031, respectively. Optimal per capita advertising expenditures were estimated at \$.0082, \$.00266, and \$.00131 for New York City, Albany, and Syracuse. In all cases, decreasing marginal returns to advertising were found.

Thraen, C.S. and D.E. Hahn, eds. 1989. *Advertising, Promotion and Consumer Use of Dairy Products: Insights from Economic Research*. Ohio State University Press, Columbus, OH. 233 pp. The first section of this compendium of articles, "An Overview of the Current Demand Situation," contains articles on the current demand for dairy products and commercial and institutional demand. The second section, "Price and Income Determinants from Commercial Disappearance Data," focuses on price and income elasticities and the effects of price and income on consumption. The third, "The Sociological and Demographic Structure of Dairy Demand from Cross-Section Data," is based on survey data on consumer consumption, preferences, and expenditures on dairy products, while the fourth, "Methodology of Demand Research," covers research issues and methodology. In the fifth, "Advertising and Demand for Dairy Products," are articles on advertising and demand simulation and the effects of advertising and promotion on consumer demand. The last section, "Promotion, Advertising, and Demand for Dairy Products," covers generic advertising effectiveness, research needs, and the future of generic dairy promotion.

Tilley, D.S. and J.Y. Lee. 1981. *Import and Retail Demand for Orange Juice in Canada*. Canadian Journal of Agricultural Economics, 29(2):171-186. Using a six-equation model, Canadian retail and import demand levels for orange juice were estimated using the inverse functional form. Own-price elasticity was estimated at -0.82 and income elasticity was 0.09. The combined import-retail price elasticities were 0.38; thus, if all import prices were to rise by 1%, Canadian retail prices would rise by .38%. U.S. juice exports were found to be affected as much by Brazilian exports as by own-price. A 1% increase in Brazilian prices would increase U.S. exports by .25%. Raising U.S. export prices would decrease U.S. orange juice exports (and increase Brazil's), but both countries' sales revenues would increase. This is not true in reverse for Brazil, however, due to the elasticity of demand.

Twining, C.R. and P.L. Henderson. 1965. *Promotional Activities of Agricultural Groups*. MRR-742. USDA, ERS, Washington, DC. Expenditures for generic advertising rose 29% between 1958-62, although the number of groups increased only 3.5%. Forty-three percent of the groups were cooperatives, 39% voluntary producer groups, and 11% commissions, councils, boards, and institutes. Producers and cooperatives provided 74% of the total promotional funds. Of the total expenditures, 25% were for branded advertising of cooperative products, 55% for generic commodity promotion, and 20% to advertise products of a particular state or region. Research accounted for 2.5% to 3% of promotional expenditures. Advertising accounted for 45% of total expenditures, with 34% of this spent on advertising fruit and 27% dairy products. Administration accounted for 10% to 13% of total expenditures.

U.S. Congress, Committee on Agriculture. 1986. *Review of Export Initiatives in the Food Security Act of 1985: Subcommittee Hearing on Department Operations, Research, and Foreign Agriculture*. Ninety-ninth Congress, Second Session, April 10. Washington, DC. This is a transcript of a hearing held to discuss the effects of budget cuts on agricultural export programs. In 1986 there were approximately 50 cooperators participating in market development activities in 130 countries, with expenditures of \$93 million (\$29 million provided by the Foreign Agricultural Service--FAS). FAS is currently trying to reduce its share by encouraging cooperators to be responsible for greater portions of their own expenses. Poor supervision and little accountability by cooperators to prove the effectiveness of their activities was also cited. No sales can be made to China or the Soviet Union due to the inability to match subsidized prices of the EEC. Overall, a more aggressive stance on export policy was seen as necessary.

United States Department of Agriculture. 1985. *U.S.D.A. Report to Congress on the Dairy Promotion Program*. Dairy Division, Agricultural Marketing Service, USDA, Washington, DC. Using a 12-region study, it was estimated that spending \$18.5 million on generic fluid milk advertising would increase fluid milk sales by 622 million pounds over sales with no generic promotion whatsoever. Adding an additional \$15 million (as was planned) would increase sales by another 129 million pounds, indicating decreasing marginal returns. Generic advertising was also found to be statistically effective in increasing cheese consumption. The analysis of split-channel cable data revealed positive increases in cheese and butter in markets exposed to generic advertising, with inconclusive fluid milk results. However, differences between and within the panels rendered the results in each test area statistically insignificant for all products advertised.

United States Department of Agriculture. 1986. *U.S.D.A. Report to Congress on the Dairy Promotion Program*. Dairy Division, Agricultural Marketing Service, USDA, Washington, DC. Using the updated 12-region study with data from 1985, generic fluid milk advertising was found effective in increasing sales. Advertising elasticity was estimated as 0.0034, own-price elasticity as -0.122, and income elasticity as 0.299. Advertising was estimated to have increased fluid milk sales by 168 to 181 million pounds of milk over the period studied (including carry-over effects). The cheese and butter study using split-cable scanner data found advertising did not have a statistically significant impact on cheese or butter consumption. This was partly due to problems with the study and intrinsic differences in the sample and control groups, however.

United States Department of Agriculture. 1987. *U.S.D.A. Report to Congress on the Dairy Promotion Program*. Dairy Division, Agricultural Marketing Service, USDA, Washington, DC. Using the 12-region study, it was estimated that from 1984-86 national generic advertising was responsible for increasing fluid milk sales by 1,624 million pounds (72.6 pounds per dollar spent) while regional generic advertising increased sales by 3,269 million pounds (101.7 pounds per dollar spent) during the same time period. Advertising elasticity was estimated as 0.0097, own-price elasticity as -0.244, and income elasticity as 0.390. Regional and national generic advertising were also estimated to have increased natural cheese consumption by 12.6 million pounds and processed cheese consumption by 38.2 million pounds. Own-price and income elasticities for natural cheese were estimated as -1.288 and 1.164, respectively. For processed cheese these estimates were -0.178 and 0.075. No cheese advertising elasticity estimates were provided.

United States Department of Agriculture. 1988. *U.S.D.A. Report to Congress on the Dairy Promotion Program*. Dairy Division, Agricultural Marketing Service, USDA, Washington, DC. The updated 12-region study included five additional demographic variables, another set of shifters representing advertising and trend, and orange juice to reflect complements/substitutes. The results indicated that the NDB's generic fluid milk advertising improved sales by 2.5%, with one dollar of advertising increasing milk sales by 42 pounds at the margin. Cheese sales increased 2% due to increased promotional spending over the same time period, with one advertising dollar responsible for .8 pound of cheese sold. Dairy calcium intakes for women did increase from 1978 to 1986, but these increases could not be directly attributed to the NDB's calcium programs. However, positive attitudes toward dairy products were found to increase consumption of all dairy foods.

United States Department of Agriculture. 1989. *U.S.D.A. Report to Congress on the Dairy Promotion Program*. Dairy Division, Agricultural Marketing Service, USDA, Washington, DC. Using the same 12-region model used in 1988, results indicate that the NDB's generic fluid milk advertising improved sales by 3.2%, with one dollar of advertising increasing milk sales by 48 pounds at the margin. Cheese sales increased 2.8% due to increased promotional spending over the same time period, with one advertising dollar responsible for .8 pound of cheese sold. While households did not increase their consumption per capita, there was an increase in total households purchasing cheese. Foodservices increased both their use of fluid milk and cheese by 9%, while butter and margarine use declined. Overall, total dairy product consumption increased 2.3% between 1986-87. Both own and substitute prices and income were found to have little effect on consumption.

United States Department of Agriculture. 1991. *U.S.D.A. Report to Congress on the Dairy Promotion Program*. Dairy Division, Agricultural Marketing Service, USDA, Washington, DC. This is the seventh annual Report to Congress that contains a description of the Board's program activities and a summary of the econometric evaluation of the fluid milk and cheese programs. A similar but improved model is used each year on an updated data set. The results indicate a continuing increase in the efficiency of the fluid milk advertising program on consumer milk demand. The cheese advertising program appears to have the most significant impact on processed-cheese sales. If fluid milk advertising expenditures were reduced by 10%, a 7.2 cent per gallon decline in real price at retail would be necessary to maintain the same quantity of sales. The impact of cheese advertising on natural cheese sales was modest, while it was relatively strong on processed cheese sales.

Venkateswaran, M. and H.W. Kinnucan. 1990. *Evaluating Fluid Milk Advertising in Ontario: The Importance of Functional Form*. Canadian Journal of Agricultural Economics, 38:471-488. Quarterly data from 1973-84 were used with several functional forms (double-log, semi-log, log-inverse, and inverse) to determine the effect of generic commodity promotion on fluid milk demand in Ontario. Estimated own-price elasticities were -0.1833, -0.1926, -0.1358, and -0.1463 for the double-log, semi-log, log-inverse, and inverse forms, respectively. In the same order, the estimated long-run advertising elasticities were 0.0445, 0.0436, 0.0600, and 0.0592. Current levels of generic promotion were estimated to increase fluid milk sales for one quarter by approximately 17 million liters using either the double-log or semi-log form, and approximately 40 million liters using the log-inverse or inverse form. Net returns to farmers per dollar spent were estimated to be approximately \$10 for the double or semi-log forms or \$24 for the log-inverse or inverse forms.

Ward, R.W. 1974. *The Econometric Impact of Canned Grapefruit Advertising and Pricing Strategies*. CIR 74-3. Florida Department of Citrus, Economic Research Department, Gainesville, FL. The effects of price and advertising changes on stocks of canned grapefruit juice were determined using data from 1966-73. It was found that a \$.25 decrease in price per case only leads to increased sales of 154,000 cases (compared to an estimated increase of 160,000 cases annually due to trend). Doubling annual generic advertising from \$1 million to \$2 million, however, was estimated to increase sales by over a million cases. Due to the very inelastic demand, decreasing prices decrease total revenues, while increasing advertising increases total revenues. Marginal returns from advertising decrease after \$1.5 million, but total revenues continue to increase at a decreasing rate until \$2.5 million. Increased prices can also lead to increased inventories, however.

Ward, R.W. 1975. *Revisiting the Dorfman-Steiner Static Advertising Theorem: An Application to the Processed Grapefruit Industry*. American Journal of Agricultural Economics, 57(3):500-504. The Dorfman-Steiner theory was used to determine an optimal generic advertising budget for canned grapefruit juice based on data from 1966-73. Three equations were used: one for retail demand, one for the retail-wholesale pricing relationship, and one relating retail and wholesale sales. Using these equations, the optimal amount of advertising was found to be 2.583 multiplied by the square root of the price per gallon of grapefruit juice. At an FOB price of \$1.50 per gallon, this results in an annual advertising budget of \$3.1 million and sales of 64 million gallons valued at \$93 million. Due to the inelastic nature of grapefruit juice demand, profits continue to increase past the optimal advertising point.

Ward, R.W. 1976. *Measuring Advertising Decay*. *Journal of Advertising Research*, 16(4):37-41. A polynomial-lag procedure was used to estimate carry-over effects of citrus advertising. A brief nonmathematical explanation demonstrates the estimation of per capita consumption based on constant or varying advertising expenditures over time, or one-time-only advertising expenditures. The results indicate that continual advertising (either varied or constant levels) produces smaller but longer-lasting effects than one-time-only efforts, which are characterized by larger increases and sharp declines. In conclusion, it was suggested that polynomial-lag procedures be used to determine in advance the effects advertising policy decisions will have on sales before advertising funds are committed.

Ward, R.W. 1988. *Evaluation of the Economic Gains from the Generic and Brand Advertising of Orange Juice, and Advertising Implications from the Generic and Brand Advertising Model for Orange Juice*. Comments Presented to the Advertising Committee, Florida Department of Citrus, Lakeland, FL. A model was specified to determine the effects of generic and brand advertising on per capita consumption of orange juice using data from 1978-88. Long-run advertising elasticities were found to be 0.027 for generic advertising and 0.031 for brand advertising. It was estimated that generic advertising increased consumption by 7.95% between 1984-87 versus 17.5% for brand advertising. However, generic expenditures of \$25 million were found to have the same marginal return as brand advertising of \$40 million. In 1987, brand advertising spent \$60 million on orange juice versus \$10 million of generic advertising, a further indication that generic orange juice advertising is underfunded relative to brand advertising.

Ward, R.W. 1989. *Economic Evaluation of Beef Promotion and Information Programs*. Report to the National Cattlemen's Association. 20 pp. Beef demand was estimated at the retail, wholesale, and farm levels using data from 1979-86. These models were then used to forecast beef prices, including the period from 1987-89 when the national beef check-off program began. Prices began to be consistently underestimated in 1987, indicating that the beef promotion program was successful in strengthening demand, with a resulting rise in prices. This was tested using two models (one more conservative than the other) that correlated beef promotion expenditures to price gains which were either one or two standard errors greater than the forecasted prices for each market level. It was estimated that expenditures of \$8 million per quarter would increase the live weight price by 1 to 2 cents per pound and the retail price by 0.6 to 2.3 cents per pound.

Ward, R.W. 1990. *Economic Impact of the Beef Checkoff Programs*. University of Florida, Gainesville, FL. 39 pp. Quarterly data from 1979-90 were used to estimate demand equations for live weight, boxed beef, and retail beef (adjusted R²s of .83, .85, and .98, respectively). The beef checkoff program was estimated to shift demand for live weight and boxed beef by a maximum of 6% to 7%, while the maximum shift for retail demand was estimated at 4%. The average rate of return was estimated as \$12.72 for each dollar spent, assuming no advertising or promotion as the base, or \$5.25, assuming the rate of promotion which existed before the national program took effect late in 1986 (\$1.5 million per quarter). However, real income growth of 5% to 6% annually was estimated to be required to outweigh the continual decline in beef demand from changing consumer preferences.

Ward, R.W., J. Chang, and S. Thompson. 1985. *Commodity Advertising: Theoretical Issues Relating to Generic and Brand Promotions*. Agribusiness

Industry Journal, 1(4):269-276. A nonquantitative comparison of brand and generic advertising leads to the following conclusions. Generic advertising encourages consumers to try a product category and reminds them to continue to buy those products, while brand advertising focuses on persuading consumers to choose a particular brand. Generic advertising thus increases total industry sales while brand advertising strives to maintain and increase market share. Economies of scale in brand advertising often result in higher consumer prices and increased market power for large firms, while economies of scale in generic advertising can benefit smaller producers and result in increased competition and lower consumer prices.

Ward, R.W. and J.E. Davis. 1978. *Coupon Redemption*. **Journal of Advertising Research**, 18(4):51-58. Coupon-redemption rates were modeled using OLS. Redemption elasticities demonstrated decreasing returns for all couponing media used, with direct mail, magazine inserts, Sunday supplements, magazines, newspapers, and on-package coupons listed in order of their effectiveness. Overall, no redemption rates over 21% were achieved, with maximum redemption occurring in the second month after distribution. On-package redemption rates were the lowest at 3%; the average redemption rate for all media was 8%. Increasing the number of coupons distributed decreases redemption rates; increasing coupon values increases redemption. Of total redemptions, 74% occur within one year of the distribution and 90% within three years. Expiration dates of one year were not found to significantly decrease redemption or consumption.

Ward, R.W. and J.E. Davis. 1978. *A Pooled Cross-Section Time Series Model of Coupon Promotions*. **American Journal of Agricultural Economics**, 60(3):393-401. Two nonlinear equations were modeled (with and without habit persistence) to determine the effects of couponing on sales of frozen concentrated orange juice using household panel data from 1972-75. While habit persistence was significant, it explained only a small amount of variation in sales. Coupons were found to be most effective when orange juice prices were at their lowest levels. As prices increased, those using coupons continued to purchase more than those not using coupons, but at decreasing rates. At lower price levels, the majority of the sales increase was due to the informational (or advertising) component of the coupon. As prices rise, this effect decreases, making it more difficult to stimulate sales.

Ward, R.W. and B.L. Dixon. 1989. *Effectiveness of Fluid Milk Advertising Since the Dairy and Tobacco Adjustment Act of 1983*. **American Journal of Agricultural Economics**, 71(3):730-740. A double-log model was estimated to determine the effect of generic promotion on fluid milk consumption using time-series, cross-sectional data from 1984-87. Price and income elasticities were estimated as -0.1534 and 0.2934, respectively. The advertising variables were statistically significant, with no advertising elasticities reported. Race and age were the most significant demographic factors. Structural shifts in consumption were attributed to the 1983 Dairy Act and the accompanying surge of fluid milk advertising. Fluid milk sales in 1984-87 were estimated to increase by 1.7 billion pounds due to the increased advertising and effectiveness of each advertising dollar. At the current level of advertising, each dollar spent increases fluid milk sales by 42 pounds.

Ward, R.W. and W.F. McDonald. 1986. *Effectiveness of Generic Milk Advertising: A Ten-Region Study*. **Agribusiness Industry Journal**, 2(1):77-89. The effect of generic advertising on fluid milk demand was examined using a nonlinear, cross-sectional time-series model with data from ten federal milk

marketing regions for 1976-83. Price elasticity was estimated as -0.09, income elasticity at 0.11, and advertising elasticity was 0.0085. Lowest consumption was in June and July, and highest in January. Advertising's effect peaked at 6 months and completely dissipated by 12 months. Optimal generic advertising expenditures were estimated to be \$16.8 million annually versus \$9.5 million actually spent. Marginal returns to advertising in 1983 were \$1.85 for each dollar spent. It was estimated that generic advertising increased per capita milk consumption by 4.5% and revenues by \$15.9 million in 1983.

Ward, R.W. and L.H. Myers. 1979. *Advertising Effectiveness and Coefficient Variation Over Time*. *Agricultural Economics Research*, 31(1):1-11. Two models were estimated to determine the effect of generic advertising on consumer demand for frozen concentrated orange juice: a first-degree polynomial using OLS with a geometric decay distributed-lag structure, and a variable coefficient model, both using data from 1967-75. Assuming an advertising investment of a million dollars per quarter for five quarters, OLS estimated an increase in per capita sales of 0.017 gallons compared to an increase of 0.065 gallons per capita from the variable coefficient model. Predictive ability of both models was tested by examining real data which had been withheld. Overall, the variable coefficient model predicted turning points and actual per capita consumption more accurately and had a 54% smaller absolute average error than the nonstochastic OLS model.

Ward, R.W., S.R. Thompson, and W.J. Armbruster. 1983. *Advertising, Promotion, and Research*. In *Federal Marketing Programs in Agriculture: Issues and Options*, W.J. Armbruster, D.R. Henderson, and R.D. Knutson, eds., pp. 91-120. Interstate Printers and Publishers, Danville, IL. An overview of generic advertising, this chapter covers the government's role in agricultural advertising, effects of brand advertising and descriptions of current programs, including research and promotion acts, marketing orders, and international marketing programs. Program evaluation is also discussed, with specific references to the dairy, citrus, and cotton industries. Generic advertising's effects on the market process and marketing efficiency are covered, as well as economic benefits and the need for supervision.

Warman, M. and M. Stief. 1990. *Evaluation of Fluid Milk Advertising*. Market Research Branch, CSSD, ASMS, USDA, Washington, DC. 25 pp. An econometric model was estimated using data from 12 regions for 1978-89 to determine the effectiveness of generic advertising on fluid milk consumption. The model was specified in double-log form and used an estimated generalized least squares estimator. Income and price elasticities were estimated as 0.2587 and -0.1301, respectively. Advertising elasticities were estimated for each year after the Dairy and Tobacco Adjustment Act took effect (e.g., September 1984), with 1985-89 estimated as 0.017, 0.0303, 0.0354, 0.0407, and 0.0463, respectively. Using simulations, it was determined that the Act increased fluid milk sales by 4.4 billion pounds, or 3.9% from September 1984 to August 1989 for an average gain of 124 pounds per advertising dollar.

Waugh, F.V. 1959. *Needed Research on the Effectiveness of Farm Products Promotions*. *Journal of Farm Economics*, 41(2):364-377. This article is an early discussion of using distributed lags to study advertising effectiveness and decay rates. The need to measure sales for several periods after advertising to include the lagged effects is stressed. Changing the demand curve through advertising and ways of quantifying those changes are also mentioned. Measuring the cross-effects of advertising on demand is discussed, as well as maximizing

net income from promotion by equating marginal returns from each promotion area or product. Using a regression equation to capture the effects of lagged advertising is recommended to determine the shape of these curves (the slope being the marginal returns).

Williams, G.W. 1985. *Returns to U.S. Soybean Export Market Development*. *Agribusiness*, 1(3):243-263. The American Soybean Association spent \$3 million for export promotion in 1980, to which was added \$7 million from FAS and third-party contributors. To determine the effect of this promotion on worldwide soybean demand, a 96-equation model was used to estimate demand, supplies, prices and trade of soybeans and soybean derivatives in each of eight global regions simultaneously. It was estimated that from 1970-80, soybean promotion increased export revenues by an annual average of 7.5%. Total returns to investment were estimated as \$62 per dollar spent. Promotion in Europe was estimated as most profitable, averaging \$88 per dollar invested, while promotion in Japan was least profitable (\$20 return). Net returns from all regions to growers were estimated at \$14.20.

Wittink, D.R. 1977. *Advertising Increases Sensitivity to Price*. *Journal of Advertising Research*, 17(2):39-42. A market-share formulation for a heavily advertised consumer good was estimated using OLS based on data from 25 major markets. To reconcile differences in elasticities between the different markets, another equation was estimated using the elasticity estimates and including interaction effects. This second equation indicated that price elasticity increased proportionately with advertising share. For example, as advertising share rose from .20 to .40, relative price elasticity rose from -0.572 to -1.144. Thus, high levels of advertising appear to increase consumer price sensitivity, rather than decrease it.

Witucki, L. 1988. *The Impact of the Export Enhancement Program on U.S. Poultry Exports*. *Livestock and Poultry Situation and Outlook Report*, pp. 59-62, LPS-29, May 1988. Economic Research Service, USDA, Washington, DC. A brief description and history of the Export Enhancement Program (EEP) is given, including a summary of the bid-setting and acceptance procedures. A total of over 60 countries are eligible for the program, which began in 1985. Three criteria must be met before a program or initiatives for an individual commodity are begun: it must increase U.S. exports, subsidized competition must be present, and the U.S. should make a net profit. The payment or "bonus" to exporters is paid in the form of CCC commodity certificates, usually grain. Descriptions of past EEP initiatives for poultry and eggs are provided, including tables of countries, value exported, and percent of imports. Lastly, prospects for further exports in the future are discussed.

Wolf, A.F. 1944. *Measuring the Effects of Agricultural Advertising*. *Journal of Farm Economics*, 26(2):327-347. A compendium of techniques and information, this article discusses types of analysis used in determining advertising effectiveness and difficulties in ascertaining whether advertising is the key factor, particularly in geographic comparisons or "before and after" studies where many confounding variables are present. Problems encountered when comparing price changes and differentials are mentioned, including comparing items not really comparable. Trade opinions were also discounted as being subjective and frequently contradictory, with no statistical validity.

Yau, C. 1990. *A Quantitative Analysis of Household Consumption of Cream*. Staff Paper, U.K. Milk Marketing Board. (Unpublished). Using multiple-

regression techniques and monthly data, models are built to explore the potential impact of generic advertising on the sales of fresh cream in England and Wales. An own-price elasticity of -0.80 is calculated, as are various seasonal sales effects. The impact of generic advertising is shown to be positive but small, with a coefficient of 0.0055 (elasticity). In conclusion, it is stated that the relatively small advertising response and value of the market do not justify the current generic spending level. Alternative ways of supporting the market are suggested.

Young, R. 1987. *Dynamic Optimization Models to Promote the Consumption of Dairy Products in the European Economic Community*. Anagram Econometrics, Ltd. U.K. (Unpublished). Using time-series analysis, the author builds a series of supply and demand equations for milk and dairy products in the EEC. Own-price elasticities for liquid milk are estimated between -0.6 and -1.08, and for butter between -0.2 and -2.0, varying between countries. Advertising is investigated for France and U.K. liquid milk and butter markets, where sizable impacts of advertising on sales are estimated. The study concludes that a more optimal balance in the EC milk market could be achieved through the implementation of quota controls on supply, allied to increased advertising spending to boost demand.

Zygmunt, J.A. 1984. *Generic Promotions, Research, and Education Programs of National Commodity Organizations*. M.S. Thesis. Department of Agricultural Economics and Rural Sociology, Ohio State University, Columbus, OH. 232 pp. In 1982, 67 national commodity organizations' budgets were studied to determine if current nutritional concerns (specifically the Dietary Goals for the U.S., 1977) affected their allocations. Regression results found a positive correlation between nutrition research budgeting and a negative Dietary Goals report (i.e., a commodity that was recommended for sparing consumption: red meat, butter, etc.). Regression equations were also estimated to determine factors influencing the total budget, the commodity improvement portion of the budget, and advertising and promotion allocations. Overall, a wealth of cross-tabular and regression results are provided, covering many factors affecting promotion program budgeting, not just those nutrition-related.

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