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Annotated Bibliography of Generic Commodity Promotion Research

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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 authors thank the many contributors and reviewers of this publication. Special thanks go to Henry Kinnucan, Ron Ward, 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.

Since I plan to continue work in this area for some time into the future, I will appreciate receiving any comments concerning the accuracy of the annotations and the completeness of the bibliography. I will also appreciate receiving copies of new or additional relevant articles.

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ABSTRACT

In this publication the attempt was made to include most of the relevant scholarly work directly related to generic commodity advertising and promotion research. While taken primarily from professional journals, some books, working papers, and dissertations were also included based on their relevance and importance. When reporting the same research, journal articles were chosen in preference to university publications.

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, however, due to the duration and extent of their advertising efforts and the evaluation components of their respective promotion programs. A few articles which focus on advertising effectiveness or evaluation for non-agricultural 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 annotations on generic promotion evaluation in Canada and the UK, as well as studies of U.S. promotions in Europe through 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.

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

TABLE OF CONTENTS

Albion, M., and P. Ferris. 1981. The Advertising Controversy: Evidence on the Economic Effects of Advertising	1
Amuah, A.K. 1985. Advertising Butter and Margarine in Canada	1
Armbruster, W.J. 1983. Advertising Farm Commodities	1
Armbruster, W.J., and L.H. Myers, eds. 1985. Seminar Proceedings on Research on Effectiveness of Agricultural Commodity Promotion . . .	1
Armbruster, W.J., and R.L. Wills, eds. 1988. Generic Agricultural Commodity Advertising and Promotion	1
Arnold, S.J., T.H. Oum, B. Pazderka, and D.W. Snetsinger. 1987. Advertising Quality in Sales Response Models	2
Australian Wool Corporation and the Bureau of Agricultural Economics. 1987. Returns From Wool Promotion in the United States	2
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. . .	2
Balmer, T.M. 1986. An Analysis of Pennsylvania Dairy Farmers' Opinions and Voting Behavior Concerning Producer-Funded Milk Advertising Programs	2
Bass, F.M., and D.G. Clarke. 1972. Testing Distributed Lag Models of Advertising Effect	2
Benham, L. 1972. The Effect of Advertising on the Price of Eyeglasses .	3
Blaylock, J.R., and W.N. Blisard. 1988. Effects of Advertising on the Demand for Cheese	3
Bockstael, N.E., and I.E. Strand. 1988. Pulsed Generic Advertising: The Case of Common Property	3
Boynton, R.D., and L. Schwendiman. 1983. Theoretical Approaches to the Economies of Advertising	3
Buzzell, R.D., and R.E.M. Nourse. 1967. Product Innovation in Food Processing	3
Case, K.E., and J.E. Shambhria. 1972. The Effects of Advertising Carryover	4
Chang, H.S. 1987. Measuring the Effects of Advertising in Food Demand Subsystems	4
Chavas, J.P., and R.D. Pope. 1984. Information: Its Measurement and Valuation	4

Clarke, D.G. 1976. Econometric Measurement of the Duration of Advertising Effect on Sales	4
Clement, W.E. 1963. Some Unique Problems in Agricultural Commodity Advertising	5
Clement, W.E., P.L. Henderson, and C.P. Eley. 1965. The Effect of Different Levels of Promotional Expenditures on Sales of Fluid Milk	5
Dhalla, N.K. 1978. Assessing the Long-Term Value of Advertising	5
Eiler, D.A., and O.D. Forker. 1973. Testing for Differences in Consumer Attitudes Toward Milk in New York State	5
Eiler, D.A., and S.R. Thompson. 1974. Adult Attitudes Toward Major Beverages in Seven New York Metropolitan Markets	5
Ekelund, R.B., and D.S. Saurman. 1988. Advertising and the Market Process: A Modern Economic View	6
Falk, H., and J.C. Miller. 1977. Amortization of Advertising Expenditures	6
Forker, O.D., D.J. Liu, and S.J. Hurst. 1987. Dairy Sales Data and Other Data Needed to Measure Effectiveness of Dairy Advertising	6
Funk, T.F., K.D. Meilke, and H.B. Huff. 1977. Effects of Retail Pricing and Advertising on Fresh Beef Sales	6
Gallo, A.E., and L.G. Hamm. 1982. Coupons, Parts I and II	6
Gallo, A.E., L. Hamm, and J.A. Zellner. 1982. Couponing's Growth in Food Marketing	7
Gallo, A. 1984. Advertising and Promotion in Food Marketing	7
Goddard, E.W., and A. Tielu. 1988. The Importance of Including Demographic Variables When Examining the Impact of Advertising Fluid Milk in Ontario	7
Goddard, E.W., and A.K. Amuah. 1989. The Demand for Canadian Fats and Oils: A Case Study of Advertising Effectiveness	7
Hall, L.L., and I.M. Foik. 1982. The Effectiveness of Generic Versus Brand Advertising for Manufactured Milk Products--The Case of Yogurt	7
Hanssens, D.M. 1980. Bivariate Time-Series Analysis of the Relationship Between Advertising and Sales	8
Henderson, P.L., and W.E. Clement. 1962. Some Guides for Improving Commodity Promotional Programs	8

Henderson, P.L. 1974. American Long Grain Rice: Sales Impact of a Promotional Program in France	8
Henderson, P.L. 1976. Butter and Cheese: Sales Changes Associated with Three Levels of Promotion	8
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 . . .	9
Hochman, E., U. Regev, and R.W. Ward. 1974. Optimal Advertising Signals in the Florida Citrus Industry: A Research Application	9
Hoofnagle, W.S. 1963. The Effectiveness of Advertising for Farm Products	9
Hoos, S. 1959. The Advertising and Promotion of Farm Products--Some Theoretical Issues	9
Jensen, H., and T. Kesevan. 1987. Generic Advertising of Food Product Characteristics	9
Jones, E., and R.W. Ward. 1989. Effectiveness of Generic Brand Advertising on Fresh and Processed Potato Products	10
Kinnucan, H.W. 1981. Performance of Shiller Lag Estimators: Some Additional Evidence	10
Kinnucan, H.W. 1981. Seasonality of Long-Run Advertising Elasticities for Fluid Milk: An Application of Smoothness Priors	10
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) . . .	10
Kinnucan, H. 1986. Demographic Versus Media Advertising Effects on Milk Demand: The Case of the New York City Market	11
Kinnucan, H., and D. Fearon. 1986. Effects of Generic and Brand Advertising of Cheese in New York City with Implications for Allocation of Funds	11
Kinnucan, H.W., and O.D. Forker. 1986. Seasonality in the Consumer Response to Milk Advertising with Implications for Milk Promotion Policy	11
Kinnucan, H. 1987. Effect of Canadian Advertising on Milk Demand: The Case of the Buffalo, New York Market	11
Kinnucan, H.W., and O.D. Forker. 1987. Asymmetry in Farm-Retail Price Transmission for Major Dairy Products	12
Kinnucan, H.W., J.H. Molnar, and B.R. Min. 1988. Industry Attitudes Towards a Dairy Check-Off Program in Korea: An Approach of Institutional Innovation Theory	12

Kinnucan, H., and O.D. Forker. 1988. Allocation of Generic Advertising Funds Among Products: A Sales Maximization Approach	12
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	12
Lambin, J.J. 1975. What is the Real Impact of Advertising	13
Lee, J.Y., L.H. Myers, and F. Forsee. 1979. Economic Effectiveness of Brand Advertising Programs of Florida Orange Juice in European Markets	13
Lee, J. 1981. Generic Advertising, FOB Price Promotion, and FOB Revenue: A Case Study of the Florida Grapefruit Juice Industry	13
Lee, J.Y. 1983. Florida Department of Citrus Advertising Research Programs	13
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	14
Lee, J.Y., M.G. Brown, and G.F. Fairchild. 1989. Some Observations on the Impact of Advertising on Demand	14
Liu, D.J., and O.D. Forker. 1988. Generic Fluid Milk Advertising, Demand Expansion, and Supply Response: The Case of New York City	14
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	14
McClelland, E.L., L. Polopolus, and L.H. Myers. 1971. Optimal Allocation of Generic Advertising Budget	15
McGuinness, T., and K. Cowling. 1975. Advertising and the Aggregate Demand for Cigarettes	15
Meissner, F. 1961. Sales and Advertising of Lettuce	15
Morrill, J.E. 1970. Industrial Advertising Pays Off	15
Morrison, R.M. 1984. Generic Advertising of Farm Products	16
National Dairy Promotion and Research Board. 1985. Report to Congress on the Dairy Promotion Program: Arthur D. Little, Inc. Econometric Analysis of the Effect of Generic Advertising on Fluid Milk, Cheese, and Butter Demand	16
National Dairy Promotion and Research Board. 1986. Report to Congress on the Dairy Promotion Program: Arthur D. Little, Inc. Econometric Analysis of the Effect of Generic Advertising on Fluid Milk, Cheese, and Butter Demand	16

National Dairy Promotion and Research Board. 1987. Report to Congress on the Dairy Promotion Program: Analysis of the Effectiveness of the Dairy Promotion Program	16
National Dairy Promotion and Research Board. 1988. Report to Congress on the Dairy Promotion Program: Analysis of the Effectiveness of the Dairy Promotion Program	17
National Dairy Promotion and Research Board. 1989. Report to Congress on the Dairy Promotion Program: Analysis of the Effectiveness of the Dairy Promotion Program	17
Nelson, P. 1974. Advertising as Information	17
Nerlove, M., and F.V. Waugh. 1961. Advertising Without Supply Control: Some Implications of A Study of the Advertising of Oranges	17
Nerlove, M., and K.J. Arrow. 1962. Optimal Advertising Policy Under Dynamic Conditions	18
Olson, M. 1971. The Logic of Collective Action: Public Goods and the Theory of Groups	18
Primeaux, W.J., Jr. 1981. An Assessment of the Effect of Competition on Advertising Intensity	18
Quilkey, J.J. 1986. Promotion of Primary Products - A View From the Cloister	18
Rausser, G.C., and E. Hochman. 1979. Deterministic Control Formulation of Advertising Policies: The Case of the Florida Department of Citrus	18
Rozek, R.P. 1982. Brand Identification and Advertising: The Case of a Generic Trademark	19
Schultz, R.L., and D.R. Wittink. 1976. The Measurement of Industry Advertising Effects	19
Sethi, S.P. 1977. Dynamic Optimal Control Models in Advertising: A Survey	19
Simon, J.L., and J. Arndt. 1980. The Shape of the Advertising Response Function	19
Strak, J., and M. Ness. 1978. A Study of Generic Advertising in the U.K. Egg Industry, 1971-1976	20
Tauer, J.R., and O.D. Forker. 1987. Dairy Promotion in the United States, 1979-1986	20
Thompson, S.R. 1974. Sales Response to Generic Promotion Efforts and Some Implications of Milk Advertising on Economic Surplus	20

Thompson, S.R., and D.A. Eiler. 1975. Producer Returns from Increased Milk Advertising	20
Thompson, S.R., and D.A. Eiler. 1975. A Multivariate Probit Analysis of Advertising Awareness on Milk Use	21
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	21
Thompson, S.R., and D.A. Eiler. 1977. Determinants of Milk Advertising Effectiveness	21
Thompson, S.R. 1979. The Response of Milk Sales to Generic Advertising and Producer Returns in the Rochester, New York Market	21
Thraen, C.S., and D.E. Hahn, eds. 1989. Advertising, Promotion and Consumer Use of Dairy Products: Insights from Economic Research .	22
Tilley, D.S., and J.Y. Lee. 1981. Import and Retail Demand for Orange Juice in Canada	22
Twining, C.R., and P.L. Henderson. 1965. Promotional Activities of Agricultural Groups	22
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	23
Ward, R.W. 1974. The Econometric Impact of Canned Grapefruit Advertising and Pricing Strategies	23
Ward, R.W. 1975. Revisiting the Dorfman-Steiner Static Advertising Theorem: An Application to the Processed Grapefruit Industry . . .	23
Ward, R.W. 1976. Measuring Advertising Decay	23
Ward, R.W., and J.E. Davis. 1978. Coupon Redemption	24
Ward, R.W., and J.E. Davis. 1978. A Pooled Cross-Section Time Series Model of Coupon Promotions	24
Ward, R.W., and L.H. Myers. 1979. Advertising Effectiveness and Coefficient Variation Over Time	24
Ward, R.W., S.R. Thompson, and W.J. Armbruster. 1983. Advertising, Promotion, and Research	24
Ward, R.W., J. Chang, and S. Thompson. 1985. Commodity Advertising: Theoretical Issues Relating to Generic and Brand Promotions	24
Ward, R.W., and W.F. McDonald. 1986. Effectiveness of Generic Milk Advertising: A Ten-Region Study	25

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	25
Ward, R.W., and B.L. Dixon. 1989. Effectiveness of Fluid Milk Advertising Since the Dairy and Tobacco Adjustment Act of 1983 . . .	25
Ward, R.W. 1989. Economic Evaluation of Beef Promotion and Information Programs	25
Waugh, F.V. 1959. Needed Research on the Effectiveness of Farm Products Promotions	26
Williams, G.W. 1985. Returns to U.S. Soybean Export Market Development	26
Wittink, D.R. 1977. Advertising Increases Sensitivity to Price	26
Wolf, A.F. 1944. Measuring the Effects of Agricultural Advertising . . .	26
Zygmunt, J.A. 1984. Generic Promotions, Research, and Education Programs of National Commodity Organizations	27

ANNOTATED BIBLIOGRAPHY OF GENERIC COMMODITY PROMOTION RESEARCH

Susan Hurst
Olan Forker

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.

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):106-13. 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, 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.

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, PA. 35 pp. A 1983 survey of Pennsylvania dairy farmers was conducted to determine if voting behavior on the 1982 PA 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.

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.

Benham, L. 1972. *The Effect of Advertising on the Price of Eyeglasses.* *Journal of Law and Economics*, 15(2):337-52. 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.* USDA, ERS, Technical Bulletin 1752. 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 .8 (own-price and income elasticities for processed cheese were -.8 and -.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.

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.

Buzzell, R.D., and R.E.M. Nourse. 1967. *Product Innovation in Food Processing.* Division of Research, Graduate School of Business Administration,

Harvard University, Boston, MA. Observations in this book are based on 10 years of warehouse shipment data and a 1965 survey of new-product development. The number of products in supermarkets increased 75% between 1950-64, with R&D spending increasing 150% over the same time period. At that time, 5.5% of ideas survived evaluations and testing, with a successful idea taking an average of three years to become a product in full distribution. Of these new products, over 39% were discontinued during test marketing or introduction. While new products tend to have higher gross margins than already established items, less than one-third broke even or made money in their first year.

Case, K.E., and J.E. Shambliia. 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.

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.

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 carryover 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 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 carryover 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.

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 10 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.

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, 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.

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., 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.

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):533-37. 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, indicating probable differences in both the management and clientele of the chains.

Gallo, A.E., and L.G. Hamm. 1982. *Coupons, Parts I and II*. *National Food Review*, 18(Spring):11-15 & 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. "Couponing, 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.** USDA, AER-486. 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.

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.

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 .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.

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 .01, .04, .03, and .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.

Hall, L.L., and I.M. Foik. 1982. **The Effectiveness of Generic Versus Brand Advertising for Manufactured Milk Products--The Case of Yogurt.** A.E. Staff Paper 82-4, Cornell University, Ithaca, NY. 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.

Hanssens, D.M. 1980. *Bivariate Time-Series Analysis of the Relationship Between Advertising and Sales*. *Applied Economics*, 12(3):329-39. 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., and W.E. Clement. 1962. *Some Guides for Improving Commodity Promotional Programs*. USDA, ERS, Marketing Economics Division, No. 75, pp. 33-37. 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.

Henderson, P.L. 1974. *American Long Grain Rice: Sales Impact of a Promotional Program in France*. USDA, Agricultural Marketing Service, MRR-1022, 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 of these 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*. USDA, ERS, AER-322, 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.

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.

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.

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):349-63. Issues discussed here include the effects of advertising on demand and prices, intrinsic differences between advertising commodities and non-farm 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.

Jensen, H., and T. Kesevan. 1987. *Generic Advertising of Food Product Characteristics*. 33rd Annual Conference Proceedings of 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.

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 .054 and .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 re-estimating 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 re-estimating 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, semi-logarithmic, log-inverse, and inverse. Using the results from the logarithmic equation, milk price elasticity was estimated at -.73 and long-run advertising elasticity at .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 .416, positive and significant cross-elasticities for coffee and cola, and a long-run advertising elasticity of .051. Race elasticity was estimated at -.593 and age elasticity at .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., 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 .0593 (.0367 in the log-inverse), and long-run brand advertising elasticity estimated at .202 for the logarithmic (.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 .78% (218 ounces), with a farm value of \$4,046,557. This would have increased producer returns by 9%.

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 .35, milk price elasticity at -.73, cola price at .51, trend at -.0005, and advertising elasticity at .121. Log-inverse elasticities for the same variables were .0001, -1.52, .004, -.0006, and

.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 to \$1.9 million.

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.W., J.H. Molnar, and B.R. Min. 1988. Industry Attitudes Towards a Dairy Check-Off Program in Korea: An Approach 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., 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 .051 for the milk equation and .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 oz. to 13.88 oz. 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.

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 (\$.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 .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.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 10 European countries. It was estimated that 23% of the total orange juice exports during 1976 and 1977 were 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).

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 carryover 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):385-94. 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 Dept. 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 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 substitutability) and differences between brand and generic advertising which 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.

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. *A.E. Research* 89-22, Cornell University, Ithaca, NY. 68 pp. 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 .99% under historical levels of manufactured product advertising alone. When these levels of fluid and manufacturing advertising were combined, fluid and manufacturing sales increased 2.67% and .85%, respectively. Rates of return to farmers were estimated at \$7.04 for fluid-only advertising and \$4.77 for fluid and manufacturing. There was no increase in return for the manufacturing-only scenario as commercial sales were offset by decreases in government purchases.

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):311-28. Two equations were estimated, one with a constant elasticity (log-linear form), 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 .2846 prior to publication of health reports on smoking to .1971 after the reports were published. Price elasticity was estimated as -1.045 and income elasticity as .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.

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 a 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 which 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. USDA, Agricultural Information Bulletin 481, 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.

National Dairy Promotion and Research Board. 1985. Report to Congress on the Dairy Promotion Program: Arthur D. Little, Inc. Econometric Analysis of the Effect of Generic Advertising on Fluid Milk, Cheese, and Butter Demand. USDA, Washington, DC. Using the 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.

National Dairy Promotion and Research Board. 1986. Report to Congress on the Dairy Promotion Program: Arthur D. Little, Inc. Econometric Analysis of the Effect of Generic Advertising on Fluid Milk, Cheese, and Butter Demand. 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 .0034, own-price elasticity as -.122, and income elasticity as .299. Advertising was estimated to have increased fluid milk sales by 168 to 181 million pounds of milk over the period studied (including carryover 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.

National Dairy Promotion and Research Board. 1987. Report to Congress on the Dairy Promotion Program: Analysis of the Effectiveness of the Dairy Promotion Program. 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 .0097, own-price elasticity as -.244, and income as .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 -.178 and .075. No cheese advertising elasticity estimates were provided.

National Dairy Promotion and Research Board. 1988. Report to Congress on the Dairy Promotion Program: Analysis of the Effectiveness of the Dairy Promotion Program. 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 pounds 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.

National Dairy Promotion and Research Board. 1989. Report to Congress on the Dairy Promotion Program: Analysis of the Effectiveness of the Dairy Promotion Program. 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 pounds 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.

Nelson, P. 1974. Advertising as Information. Journal of Political Economy, 82(4):729-754. In advertising, "search" qualities are defined as those which 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.

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 -.72, income elasticity .67, and the long-run advertising elasticity .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.

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.

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.

Primeaux, W.J., Jr. 1981. An Assessment of the Effect of Competition on Advertising Intensity. *Economic Inquiry*, 19(4):613-25. 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 carryover, 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.

Rozeq, R.P. 1982. Brand Identification and Advertising: The Case of a Generic Trademark. *Applied Economics*, 14(3):235-48. 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 her absence, and until the marginal revenue of that last advertising unit equals its cost.

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 which 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.

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, 4) control-theoretic empirical. An example of advertising capital models is the Nerlove-Arrow model which uses a "stock" of goodwill to explain the effects of current and past advertising expenditures, while sales-advertising response models incorporate the carryover effects of advertising. Micro models include diffusion models, dynamic adjustment models, and persuasive advertising models. Adding an investment function to Nerlove & 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.

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 3 months (R^2 of .42 and Durbin-Watson of 1.54). Long-run elasticity of demand with respect to advertising was .01, with price elasticity of demand estimated to be -.1. Assuming a price elasticity of supply of between +2.0 to +.6, optimal advertising to sales ratios were estimated as .43 to 1.20. Actual advertising to sales ratios ranged from .44 in 1973 to .40 in 1977 (the low end of the "optimal" range). Assuming elasticity of supply to be +.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 (-.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 (\$.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., 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 $-.185$, income elasticity of $.285$ (not significant), and an estimated increase in total fluid milk sales of 1.93 ounces per capita for each \$.01 increase in monthly per capita advertising. The estimated value to the farmer of each ounce increase in fluid milk sales was \$.0016. Producer returns (over the cost of advertising) were estimated to be \$.105 in New York City, \$.028 in Albany, and \$ -0.038 in Syracuse (per capita).

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., 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 $-.031$, 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.

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 .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. 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 $-.36$, income elasticity $.34$, and the cross elasticity for soft drinks was $.2$. Long-run advertising elasticity of demand was estimated to be $.0149$. 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/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.

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 $-.82$ and income elasticity was $.09$. The combined import-retail price elasticities were $.38$; 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*. USDA, ERS, MRR-742, 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, 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.

Ward, R.W. 1974. The Econometric Impact of Canned Grapefruit Advertising and Pricing Strategies. Florida Department of Citrus, Economic Research Department, CIR 74-3, 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 decreases 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 carryover 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., 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 non-linear 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 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 .017 gallons compared to an increase of .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.

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 non-quantitative 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 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 non-linear, cross-sectional time-series model with data from 10 federal milk marketing regions for 1976-83. Price elasticity was estimated as $-.09$, income elasticity at $.11$, and advertising elasticity was $.0085$. Lowest consumption was in June and July, and highest in January. Advertising's effect peaked at six 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. 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 $.027$ for generic advertising and $.031$ 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., 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 elasticity were estimated as $-.1534$ and $.2934$, 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. 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) which 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 .6 to 2.3 cents per pound.

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 8 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 -.572 to -1.144. Thus, high levels of advertising appear to increase consumer price sensitivity, rather than decrease it.

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.

Zygmunt, J.A. 1984. **Generic Promotions, Research, and Education Programs of National Commodity Organizations.** MS 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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