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RESEARCH OPPORTUNITIES

Chairperson: Howard Phillips, Miller Enterprises

Concepts to Reality — A Short Research Review

by

Harold S. Ricker
Deputy Director, MRD
USDA, AMS
Washington, D.C. 20250

I've been asked to take this opportunity to reflect on a few past research activities conducted mostly by USDA to illustrate a couple of important and often overlooked points about marketing research as we know it. While my examples came from USDA, I think it is obvious that university researchers in marketing can readily identify with the issues raised. My examples are shown merely to present the diversity of the work that has been done and to help make a few points. A chronology of past research is well beyond the time allotted or the intent of the paper. The format I'm going to follow is to identify briefly the problem and the concept or approach developed to resolve it, with a brief discussion of the impacts.

Wholesale Market Development

I would be remiss if I didn't start with our longest running research program that dates back to the Agricultural Marketing Act of 1946 and for which our Division came into existence. The problem was that many wholesale facilities were modern in design and perfectly adequate when they were constructed, whether as separate units in the center of the city or as multi-unit facilities in new distribution centers. Changing technology, however, made some of these facili-

ties obsolete. In this market, larger trucks have turned the center street into a nightmare of congestion. Wholesalers find it very difficult to use modern handling equipment and storage aids with the low ceilings and freight elevators in these facilities. The concept and approach for a solution is a modern wholesale distribution center. These centers, industrial parks for food firms, allow them to move their operations into modern facilities, located with good highway and rail access to minimize delivery costs, utilize modern materials handling equipment, and share essential services.

Since the Act, studies have been conducted in about 80 cities with over half developing new distribution centers. It takes close to ten years from the time a study is done before a center is open for business. The study for this center for Baltimore, Maryland, was conducted in 1968, the market built and opened on 400 acres in Jessup in 1976 and construction on the final acreage is anticipated to be completed in 1984 or 1985. No individual wholesaler could or would have undertaken the study, yet many who have located on the market found their business increased substantially and their operating costs decreased, while paying higher rent or

mortgage costs. People have been predicting the demise of these markets for twenty years, yet the ground is being broken now for what will probably be the largest one ever built in the United States in northern New Jersey.

Checkout Systems

Our interest in supermarket checkout operations dates back to the late forties when we recognized this area as a major bottleneck in supermarkets and developed improved work stations, procedures, and engineered performance standards, including adding an automatic change dispenser. Thus, it was only natural that with the development of electronics that we developed specifications for an optical scanning checkout system in 1965. Major mechanical cash register manufacturers were not interested, but an electrical engineer with supermarket experience was, and in July 1970 delivered the prototype he built, to us for evaluation. His model was demonstrated to trade associations, supermarket operators, government officials, and a major computer manufacturer in 1970. Our tests were completed and an evaluation report was released in April 1971.¹

This study demonstrated the catalytic effect of marketing research by USDA. Recognizing that scanning systems were right around the corner, the food industry established an ad hoc committee composed of grocery manufacturers, wholesalers, brokers, and retailers to develop the Universal Product Code that appears on most items today. We have all seen the rapid adoption of the optical scanner in supermarkets throughout the country. A continuing study is nearing completion in cooperation with the University of Georgia to look at applications for mid- and low-volume retail stores.

Estimated hard savings from the checkout were estimated at 1.5 percent of sales in 1971 with soft savings more than double that.

The hard savings estimates still seem to be on target, but firms have scarcely touched the soft savings. Of the \$252 billion in retail food stores sales in 1982, more than \$67 billion is through stores with sales exceeding \$8 million annually. An estimated savings of 1.5 percent with the scanning checkout system would exceed \$1 billion in one year alone, which in turn exceeds all the funds spent for marketing research since the inception of the program in 1946.

Central Meat Processing

In the late fifties and early sixties, we recognized that the costs of maintaining fully staffed butcher shops in the back of every retail store was becoming prohibitive. A new concept, centralized processing of fresh meat for retail stores was tested through development of a new central plant specifically designed for the processing function. The equipment cost with use of the central plant was more than 50 percent less than with conventional methods.² Automatic wrapping machines, scales, and pricing machines were used in the central plant that were not affordable in retail store operations. Through labor specialization and with better equipment and more volume, productivity was increased nearly 100 percent. As a sensitive labor issue, few chains were willing to adopt the system, but it probably precipitated the widespread adoption of central processing of primal and sub-primal meat cuts in the late sixties, and the more recent shift to boxed beef. The researchers that worked with the innovating firm and published the results were rewarded by getting their program cut out of the budget, but a concept had been tested that caused packers and retailers to examine and change the way meat would be handled in the future. The logical extension of the work will probably be packer preparation of retail consumer ready cuts at the packing plant.

Wholesaling

With the rapid growth of corporate retail chains, policy makers became concerned about the survival of the independent. This survival depended upon efficient and dependable sources of supply, and this supply system needed help. The concept of retailer affiliation with wholesalers through voluntary and cooperative group programs was helped by a study on wholesaler-retailer relations in 1953.³ The establishment of a complete supply depot for retailers affiliated with wholesale food distributors was enhanced by research on warehouse handling of produce, meat, frozen foods, and on office procedures. The concept was to use a combination of economic/engineering studies to determine ways existing operations could be improved or adapted to use new technology. In most cases, the research was conducted in cooperation with industry leaders, who, because of their recognized leadership position, were effective in adopting improved methods which provided an example that other distributors followed.

Research has been conducted on unitized shipment of grocery products from supplier to warehouse distribution center.⁴ In one study, the costs were measured for various methods of truck shipment and total costs with slip sheet shipments were found to be more than \$45 less than other methods.⁵ However, warehouse distribution center costs were greater for unloading slip sheeted product than with other methods and many warehouse distributors were reluctant to incur the added equipment and labor costs without reimbursement. After the study, one supplier initiated a payment program to encourage distribution warehouses to handle slip sheeted product mechanically.

Research is being conducted to assist produce wholesalers in computerizing their operations. Computer salespeople do not understand the needs of produce wholesalers and wholesalers do not understand computers. The result is that potential innovators have put in

systems that don't do what produce wholesalers want and they have had to scrap them. After studying their operations, and available technology, we have been able to work with a contractor to develop the equipment and software that meets their needs and have successfully installed it with one firm at nearly half the cost of the off-the-shelf systems. These were two classic examples of objective independent researchers working with more than one firm in the system to help them all improve the way the system operates through better understanding. It is characteristic of the types of research undertaken by USDA and FDRS members.

There are still too many trucks making uneconomical stops to supply many retail and food service outlets in the form of vendor direct store delivery items. A recently completed study on the potential for consolidated delivery of vendor items determined that the average supermarket receives 85 direct store deliveries and 3.4 deliveries from the warehouse each week, with the former accounting for approximately 25 percent of store sales.⁶ The costs of the current direct store delivery system averaged \$1.137 per case while projected costs for consolidated warehousing and delivery averages \$0.732 per case for a potential 36 percent saving. Stated another way, projected savings for a 50 store group, within a 20-mile radius of a consolidation warehouse would total \$1.5 million annually. Bakers and snack food firms, who lack the type of research capability to do this work are seriously considering the application, but will require additional technical assistance first.

Establishing a Marketing System

A different type of project deals directly with farmers and chain store buyers to develop a marketing system. Farmers in southwestern and southside Virginia complained of low prices for cabbage, corn, and soybeans, and fear the loss of their tobacco program. A

joint project was established with Virginia Tech to explore the development of markets for alternative crops and to develop a marketing system. The concept involved a team approach to identify alternatives and included economists, marketing specialists, engineers, horticulturalists, pathologists, extension service personnel, agricultural cooperative specialists, state and local officials, buyers from retail chains, and of course growers. No retailer or farmer would or could assemble such a team, and most research projects undertaken today do not either.

Meetings were held with farmers to determine potential interest in commercial vegetable production. Data obtained from other sources included historical per capita consumption patterns for selected vegetables, expressions of interest and comments from retail and wholesale produce buyers, demonstration trials were conducted by VPI, and production costs were determined from extension budgets. Data analyses showed potential through market windows for broccoli and cauliflower from late September through December. Retail buyers were very receptive to locally grown produce and, based on earlier experience, complained only about lack of uniform size and quality and lack of advanced warning of product availability. A grower cooperative was formed in order to establish a facility specifically designed to wash, inspect, grade, cool, package, and market the product. Production of fall broccoli started in the summer of 1983 with harvesting and marketing in October and November. The results were a crop that was above average in quality and buyers and local consumers who were pleased with the product. Cooling and packaging worked well and the growers netted \$861 per acre on average for family labor. Major broccoli acreage expansion is under way this fall (1984).

Requests for this type of assistance have come from several states and we are in the process of preparing a publication that will provide guides

for conducting such studies by other institutions.

Agricultural Exports

Michigan bean growers were experiencing excessive claims on shipments of dry beans to the United Kingdom and Italy. We were asked for help and tested four distribution methods for exporting the dry edible beans. It was determined that bulk handling in van containers would reduce handling costs and claims in the amount of \$2 million annually on export shipments to the United Kingdom. This study was completed in 1974 and virtually 100 percent of the exports are now in van containers. Similar research on dry edible bean shipments to Italy has not only resulted in reduced handling costs, but by instrumenting and monitoring selected shipments has practically eliminated damage claims of more than \$1.5 million annually. The industry has testified before Congress that this research secured and established a \$12 million annual export market to Italy.

Summary

With these few examples, I've tried to illustrate some economic/engineering aspects of marketing research that can be best undertaken by the public sector, whether federal or state. A private firm is unlikely to undertake such research because of the time involved from start to application, the fact that it involves other firms, and the lack of expertise needed both to identify and to develop the concepts, as well as to carry out the studies. Once the concept has been tested and reported, innovative firms begin the process of adoption, which, depending upon the concept, may take a considerable length of time.

The research projects discussed are but a few of many undertaken over the past 35 years. They have resulted in more efficient meat, poultry and egg, and dairy processing plants, and improved handling processes from harvest

at the farm to the consumer's table. The dominant theme is that with a small expenditure of money, a catalyst can get industries that are heavily involved in the day-to-day operating issues to innovate and stay competitive. A list of future research issues is beyond the scope of this paper, but I would call your attention to the article on future food distribution research issues that many of your and your colleagues contributed to.⁷

Endnotes

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⁷Ricker, H. S. and J. L. Cain, "Food Distribution Research Through 1990," Progressive Grocer Executive Report, July 1984, pp. 56-59.