



AgEcon SEARCH
RESEARCH IN AGRICULTURAL & APPLIED ECONOMICS

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

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

Help ensure our sustainability.

Give to AgEcon Search

AgEcon Search

<http://ageconsearch.umn.edu>

aesearch@umn.edu

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

PHYSICAL DISTRIBUTION SYSTEM DESIGN IN THE FOOD INDUSTRY: INDUSTRY IMPERATIVES FOR INCREASED PRODUCTIVITY

by
Bernard J. La Londe
The Ohio State University
Columbus, Ohio
and
Wilber S. Wayman, Jr.
Georgia State University
Atlanta, Georgia

The authors discuss opportunities for improved productivity in physical distribution and what the food industry must do to take advantage of these opportunities.

Physical distribution remains high on the list of areas of interest to the food industry. This interest has been heightened recently by the national effort to increase the productivity of all American industry, especially the food industry. Since no one organizational entity controls the flow of food products from the farm to the consumer, physical distribution becomes a true "industry" issue, affecting processors, brokers, retailers and a wide variety of other food middlemen.

This presentation will consider three basic questions relative to physical distribution in the food industry:

1. Why does physical distribution continue to be a major area of management interest?
2. Where are the physical distribution opportunities for improved productivity?
3. What must the food industry do to realize the benefits of physical distribution productivity opportunities?

There are four basic factors which influence the continued interest of the food industry in physical distribution. They are: 1) the continuing erosion of profit margins, 2) the relatively high

cost of physical distribution activities, 3) the continuing proliferation of products, and 4) pressures by the federal government to measure and increase productivity.

Accounting profits are calculated by subtracting costs from revenues. To improve profits a firm in the channel of food distribution must either increase revenues relative to costs, or reduce costs relative to revenues. The result, improved profit margins, is the same in either case, but the focus of management efforts is different. Ideally, revenues would be increased at the same time costs are decreased.

Recent experience indicates that increased consumer awareness of the supply/demand relationships in food distribution, due in part to governmental price control activities, has provided more flexibility for some channel members to increase revenues by increasing prices. It has been proclaimed by industry spokesmen that the era of "cheap food" is past. Unfortunately, all members of the channel were not affected equally. The Cornell University study for FY 72/73 revealed that food chains experienced a net operating loss, with overall net profits less than one half of one percent.

While efforts to educate the consumer to the profit-cost facts of the food industry might offer some hope of additional pricing flexibility, benefiting all channel members, the consumer will continue to exhibit a bias toward lower

food costs. This will mean that efforts to reduce costs, in this case physical distribution costs, will continue to provide the greatest potential for alleviating the cost/profit squeeze.

This is not meant to imply that integrated physical distribution management focuses solely on the cost side of the accounting profit equation. A key factor in generating sales and revenues is having the product on the shelf when the consumer wants to buy. Inventory management and control policies, guided by some statement of customer service levels, are the basis for a sound physical distribution system. But given such a statement of customer service level, the challenge of the physical distribution manager is to deliver the customer service level required, at the least cost.

The cost of moving food products through physical distribution channels has been estimated at 15% to 24% of total food sales. The total physical distribution cost is enormous when viewed in terms of an industry with total food sales of \$118 billion dollars. Physical flows of food products are characterized by high-volume, low-density, and low-value items, with distribution over a nationwide network. Even a small cost savings on each case can produce significant reductions in total physical distribution costs in such a high aggregate cost, high throughput channel.

The basic product strategy of major food manufacturers and processors continues to be that of seeking new food products with larger profit margins. This is in response to the perceived needs of consumers, armed with sufficient discretionary income to be choosy, who are seeking new, tasty, convenient food items. The result has been to increase the rate of introduction of new items and to enlarge the total items available to the consumer at the retail level. Since 1950, the number of line items in the average supermarket increased from 3000 to 8500+. Approximately one third

of the items on the supermarket shelf today were not there ten years ago. Physical distribution activities in the food industry consequently have become more complex, more costly, and of greater interest to food industry executives.

The advent of the superstore or European type hyper-markets will tend to compound the above problems of physical product flows. In the first place, the sheer volume of throughput will increase in a store with greatly expanded floor space devoted to food products. Problems associated with scheduling delivery of items to the stores and movement and stocking on the selling floor will be increased. Secondly, the physical distribution task will be more complex due to an increase in the number of individual food items offered in a single store. Effectively planning and controlling the flood of food products moving through superstores will present many opportunities for cost reduction and/or service improvement in physical distribution management.

Recently food industry interest in physical distribution has been increased by government pressures to increase productivity. The National Commission on Productivity views transportation, materials handling, and packaging activities as potential areas for increasing food industry efficiency. The consensus is that the "simplistic achievements" to greater productivity have occurred, and that now the industry must move toward more comprehensive solutions. The Commission has exhorted the industry to consider joint efforts and industry-wide solutions. Since the total physical distribution system for food products extends far beyond the boundaries of any one organization, the total food industry approach should open up many new areas for coordination, communications and cooperation.

The above four factors are not the only ones which influence the continued interest of the food industry in physical distribution. The energy crunch may become a major factor as the total

implications for food distribution become apparent. Such factors as the concern with ecology, product quality, and system security will all continue to contribute to a growing interest in effective food systems management.

Physical Distribution Opportunities for Improved Productivity

Each one of the major physical distribution activities continues to offer opportunities for increasing the productivity of food distribution. The activity singled out most prominently by the National Commission on Productivity has been transportation. There are still too many individual trucks making time-consuming deliveries of small quantities of food products to the back of retail stores. The "General Foods" rule on back hauls still forces numerous trucks to deadhead one way, although at this writing, it appears the FTC may reverse its stand on this issue. There continues to be too much handling between transportation carriers and the docks due to the variety of packaging, pallets, and materials handling equipment. The dependability of deliveries in congested urban areas continues to decline and the cost of delivery continues to increase.

Members of the food industry continue to increase the level of mechanization and automation in their warehousing operations. The trade literature has publicized the recent accomplishments of A & P, Giant Foods and others in automating their picking systems in new warehouse installations, by using new, advanced handling systems. With such systems throughput can be greatly increased. However, approximately 25% of the movement continues to be picked manually, because of odd size cases,* or because items are very fast or very slow movers. Such installations also involve significantly higher startup costs, higher maintenance costs, and reduce the flexibility of manpower. Food industry management is giving this avenue of productivity increases a hard look to insure that the return on investment is really there.

Inventory management policies are another area where opportunities for increased revenues through improved levels of customer service, and through reductions in associated inventory costs are being discovered. Reducing the uncertainty, or increasing the dependability of food product flows have been the rationale behind some companies vertically integrating the food distribution channel. This has been evidenced by private ownership or contractual control of manufacturing, wholesaling, and retailing activities, to include private transportation and private warehousing. Companies that have integrated only the wholesale-retail portion of the channel have often been disappointed by the lack of response on the part of food manufacturers and processors to the improved product information and control realized by their integration. When improved inventory management permits increased product flows in one portion of the channel, out-of-stock conditions can result unless all members of the channel respond accordingly. Tremendous opportunities continue to exist in improving the flow of inventory control information so that all members of the channel can benefit.

From the above brief discussion of physical distribution opportunities in the food industry one concept becomes clear. Physical distribution transcends the boundaries of organizations. While many opportunities still exist for individual organizations to improve the physical distribution activities under their direct control, there are other opportunities of a significantly higher level of magnitude, which can be realized only by inter-organizational or industry-wide efforts. At present these opportunities focus on three areas: packaging, pallets, and product codes, with standardization being the direction for management attention.

The package in which a product moves through a distribution channel affects every piece of transportation and materials handling equipment in the channel. The package must be sturdy enough for manual, mechanical and automated handling. It must also be

sufficiently limited in sizes that mechanical and automated handling of most packages is possible.

The next possible level of aggregation of packages is into pallets. Pallets too must be sturdy enough to travel through the channel without undue damage, and they must be sufficiently limited in sizes so that mechanical and automated handling of most pallets is possible. C. Jackson Grayson, Jr., former Chairman of the Price Commission, has stated that transportation efficiency is lowered by as much as 25 percent because package and pallet sizes are not standardized. The standardization of package and pallet sizes offers not only opportunities for increasing the throughput of the total channel, but also of reducing the damages caused by the proliferation of package and pallet dimensions.

The adoption by the food industry on April 3, 1973 of the 10 digit code for food product identification presents a variety of opportunities for improving productivity. The most obvious of these opportunities are increasing the productivity of check-out operations reducing price marking and repricing activities, and by reducing misrings at the register. Other areas for increasing productivity are in inventory reduction, reduction of out-of-stock, improved space allocation; and improved control of product movements from the processor to the retail store. The physical distribution manager in the food industry needs more accurate, timely, and precise product information in order to improve his decision-making. The adoption of a universal product code for food products constitutes a major step toward the realization of this goal.

It would appear then that the efforts of food managers to improve the productivity of the food industry should focus on standardizing package and pallet sizes, and product identification codes. Standardization in these areas of physical distribution, however, are only possible by inter-organizational and

industry-wide cooperation. The various forms this cooperation may take are the subject of the final part of this presentation.

Inter-Organizational and Industry-Wide Cooperation

E. B. Weiss in a series of articles on Pooled Marketing in Advertising Age has highlighted one form inter-organizational cooperation can take. A close reading of his examples shows that in some cases the cooperation is really "Pooled Physical Distribution". Corporate chains in some instances, are joining with grocery wholesalers to improve their distribution in certain geographical areas, rather than expand their own facility or build a new one. Food processors are joining in efforts to improve the organization, training and sophistication of food brokers, rather than expanding their own sales and physical distribution management activities. These kinds of joint or pooled ventures will expand greatly in the future as organizations seek productivity increases beyond their organizational boundaries.

The success of the Uniform Grocery Product Code Council indicates another form industry-wide cooperation can take. Interestingly enough, the final code selected for grocery products was not one suggested by any single party, but rather one designed by the Council from all the competing designs. The formation of councils to study and recommend solutions to industry-wide problems in physical distribution offers a second inter-organizational form for cooperation.

Members of the food industry, recognizing that the pallet exchange program was virtually dead, have recently organized a Grocery Pallet Council. The Council plans to establish an aggressive licensing program to insure the production of pallets to approved specifications and it plans an intensive promotional and educational program to improve the pallet interchange program. There also exists persuasive evidence that the food industry

sorely needs a "Grocery Packaging Council" to address the problem of package standardization. When such industry-wide physical distribution problems are revealed, the "Grocery Council" could provide a useful organizational form to find, evaluate, and implement solutions.

Another level of inter-organizational or industry-wide cooperation is needed. At this level food distribution research could be supported to better define potential areas for productivity improvements, and to provide early warning of emerging problem areas. Physical distribution activities would be one of the areas of interest for such an organization. It is noted that the food industry has elected to retain

for another year its Ad Hoc Food Council. A steering committee is to report recommendations to the Council by February 1, 1974 on how to improve the performance of the food industry. Such an organization with the goals as stated is needed to provide attention to physical distribution activities. Without such an organization, the potential inter-organizational and industry-wide productivity improvements in physical distribution will not be expeditiously recognized and solved.

* There are approximately 2000 different case sizes in the U.S. food industry.