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# EXECUTIVE SUMMARY

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The identification of new or emerging food marketing technologies that will have significant long-range impacts on society and the U.S. food system was the objective of this preliminary analysis.

Food marketing is defined as the activities that take place within the food system from the farm gate to the consumer. These activities include processing, wholesaling, retailing, transportation, and food service. In 1977 consumers spent \$180 billion on domestically produced food. The marketing bill was \$123.5 billion, or 68.6 percent of this total, which represents more than twice the farm value of that food.

Using a mail survey, a working group, and collateral staff work, the Office of Technology Assessment (OTA) has identified the social and economic factors that interact with and may be expected to influence the emergence and adoption of marketing technologies. The availability and cost of energy, supply of and demand for food (domestically and worldwide), environmental concerns, food safety, nutrition and health, and consumer attitudes are the major factors identified. Other elements include the availability and use of raw materials, importance of preventing spoilage and waste in the marketing system, and the effect of changing lifestyles on consumer preferences and attitudes.

These socioeconomic elements and the marketing technologies are outlined and analyzed using two differing scenarios. The first scenario assumes that only minor changes will occur in the socioeconomic climate through the year 2000 and that trends will continue basically the same as they are today. The second, which is felt to be the more realistic and applicable, assumes changes from the current situation that will effect concomitant changes in the food marketing system.

Each technology is examined from the following points of view:

- . Its current state of development;
- The degree of probability that if and when developed it will be adopted into the marketplace;
- . The extent to which it will be used;
- . Expected impacts, both negative and positive, of the technology and where these impacts may be felt; and
- Significant policy issues that may be explored in connection with a given technology and the effect it may have on society.

On the basis of the foregoing, seven technologies were judged by OTA as highest priority.

- Texturing, binding, flavoring, and associated technologies that will produce engineered or fabricated foods to substitute either for a complete food (such as meat or dairy product substitutes) or for an ingredient or ingredients in currently produced foods.

- Technologies that provide quality assurance in vehicles used to transport food and food products. These include identification, tracking, and cleaning of contaminated vehicles; freight car design; and the use of certain vehicles to transport only food and noncontaminating, food-compatible commodities.
- Technologies that produce the reportable pouch, a multilayer plastic and aluminum package that will withstand heat processing and produce shelf-stable products in no need of refrigeration before opening.
- Electronic checkout in retail food stores, including systems able to scan the Universal Product Code currently printed on about 80 percent of food packages in grocery stores.
- Technologies to reduce the extent of food loss throughout the marketing system—including processing and packaging, transportation, and retailing—and in food service and home preparation.
- Electronic food shopping systems as alternatives to current retailing systems. These include warehouse-to-door delivery, automated mini-markets, and mobile automated markets that would travel to the customers. The effect of these systems would be to make food available in areas where the retailing system is now inadequate or to supply food in areas of special need.
- Technologies for recyclable and returnable food containers that would extend present technology beyond beverages to other applicable foods.

Most of these technologies are directly concerned with preventing food losses in the food system, conserving resources through more efficient processing methods or waste reduction in the delivery system, and producing new foods to substitute for traditional ones. Others, such as the electronic checkout and electronic food shopping systems, reflect concerns over technologies that may be economically justified but that may have undesirable consequences to society's quality of life. Some of these technologies are in use, some exist in the developmental stage, and some are identified as areas where technological innovation is needed to respond to an existing, emerging, or potential problem. These technologies will have both positive and negative effects on agricultural producers, food manufacturers, processors, retailers, labor, and consumers. Will steps be taken to attempt to maximize the benefits and to minimize the negative consequences?