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SYMPOSIUM ON NUTRITIONAL, SENSORY, AND CHEMICAL CHANGES ASSOCIATED WITH ASEPTIC PACKAGING OF FOODS

Introduction

Aseptic packaging has been at the forefront of food industry interests since Feb 9, 1981, when the Food and Drug Administration ruled to permit the use of hydrogen peroxide and heat as sterilizing agents. The acceptance of hydrogen peroxide permitted the use of aseptic packaging systems that employ a wide variety of materials, namely polymers, aluminum foil, and laminates of paper to polymers and aluminum foil. Aseptic packaging refers to a technique in which food is commercially sterilized outside of the package and aseptically deposited in a previously sterilized package and sealed. An important component of the total system, namely aseptic food processing, reduces thermally induced changes in the food by using high-temperature–short-time (HTST) or ultrahigh-temperature (UHT) processing methods. In essence, food outside of a container may be passed through an efficient heat exchanger (plate-type or tubular scraped surface-type) and brought to sterilization temperatures quickly, whereas the time necessary to sterilize food in a container (commonly known as retort) may take minutes or hours. Additionally, production of a commercially sterile food, separate from the container, permits recovery and reuse of the energy used for thermal processing.

The advent of aseptic packaging permitted the use of nontraditional food packaging materials. The type of interaction of these packaging materials with the food within is important to the shelf life of an aseptically packaged food. It has been widely acknowledged that the ability of the packaging material to prevent oxygen migration into the food may be the most critical factor in terms of preventing undesirable flavor change and nutrient loss. Foods, especially fruit juices, packed in flexible packages with high oxygen permeability properties exhibit poor ascorbic acid retention, increased discoloration (browning), and an overall reduction in flavor quality. Flexible packages offer economic savings over conventional glass and canned containers but, for the most part, are permeable to oxygen. One relatively new problem area with aseptic packaging of fruit juices and drinks is the possible absorption of flavor components from the juice by the polymeric materials of the package. Because of the lipophilic nature of the aromatic oil fraction and the polymeric material such as polypropylene and polyethylene, the oil will absorb into the package material. Absorption of important oil-soluble flavor components could influence consumer perception of the juice because of the flat taste or loss of the freshlike quality.

Food-processing equipment and procedures necessary to produce an aseptically packaged food are changing. The number of aseptic packaging systems is increasing as well as the diversity of materials suitable for aseptic packaging. Food products prepared by aseptic processing and packaging can be both positively and negatively impacted when compared to traditional preparation methods.

The purpose of this symposium was to discuss those factors that affect the nutritional, sensory, and chemical changes of aseptically packaged foods. To this end, papers addressed (a) changing food processing equipment and procedures, (b) reaction kinetics and process design for HTST and UHT aseptic thermal processing, (c) estimation of thermal degradation in processed food, (d) postprocessing changes in food products, and (e) effects of product deaeration upon sensory and nutritional quality of aseptically packaged orange juice. Finally, we express our thanks to all speakers who took part in this frontier research symposium and to the *Journal of Agricultural and Food Chemistry* for accepting these papers for publication.

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