Chapter 5
Modified Atmospheric Packaging as a Sustainable Food Marketing and Preservation Tool

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ABSTRACT

The global food system faces population growth, climate change, and arable land depletion challenges. Innovative food management techniques are needed to address food security threats. Modified Atmospheric Packaging (MAP) offers a solution that extends shelf life and reduces waste. It demonstrates how MAP enhances global food distribution capabilities, aligning with supply chains and marketing strategies in the food industry. The findings offer actionable insights for professionals. Supply chain teams can use MAP to improve operational efficiency. Marketers can leverage

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MAP for brand differentiation. Both functions benefit from MAP's market expansion potential. By maintaining quality without preservatives, MAP makes diverse foods accessible in markets where they were previously unavailable.

INTRODUCTION

Food needs to be preserved from spoilage before its consumption for various reasons. Increasing the shelf life of food can help it be transported over longer distances. It makes food available on a fresh, nutritious, and tasty dining table. At the same time, its natural texture and appearance can be maintained, as if it were just being peeled. Harvested food is generally preserved to prevent spoilage before consumption. Unfortunately, an enormous quantity of food goes to waste. Up to 35% of fruit exits the sales cycle and ends in waste disposal centers (Naserzadeh & Mahmoudi, 2024). Increasing the shelf life of food is considered a vital step in the food cycle. This is accomplished by preventing decomposition, fermentation, and other modes. This is important considering the global scarcity of commodities, especially perishable food. Considering this importance, several food preservation techniques have been developed over time. Drying, Refrigeration, and Fermentation are considered Traditional food preservation methods. Canning, Pasteurization, Freezing, Irradiation, and adding Chemicals are relatively modern methods. However, both traditional and modern methods have pros and cons, leading to the quest for more improved methods of food preservation. Integrating preservation technologies like MAP into supply chains is a strategic imperative, enabling market expansion by synchronizing operational efficiency in logistics with consumer-facing marketing demands for fresh, minimally processed foods. They allow agri-businesses to align operational efficiency with consumer demand for fresh, minimally processed foods.

Background

Food is scarce for various reasons. Several determinants are hampering the food production process. The list includes climate change (Saccone & Vallino, 2025), population growth (Abbas et al., 2025), agricultural land and environmental degradation (Nor & Yusof, 2025), water scarcity (Palatnik et al., 2025), and food distribution inefficiencies (Al-Thani et al., 2025). There is an urgent need to counter food security issues. In this context, Modified Atmosphere Packaging (MAP) emerges as a preservation technology and a strategic interface between supply chain efficiency, sustainability, and consumer-facing marketing.

From a sustainability and operational efficiency standpoint, MAP mitigates food waste by extending shelf life, thereby reducing losses across the supply chain