

Shelf-Life Breakthrough for Case-Ready Meat

New system preserves the taste and visual appeal of refrigerated meat for three weeks on average

A new development in modified atmosphere packaging (MAP) promises to take case-ready meat into a new era of extended freshness, taste and visual appeal. FreshPax[®] CR is a low-oxygen packaging system that maintains refrigerated meat in pristine condition for 15 to 30 days. FreshPax CR is designed to decrease waste, reduce cost at retail, and provide consumers with fresh and visually appealing beef, pork, lamb and other value-added meat products.

Controlling Oxygen and Prolonging Shelf Life

Oxygen is the main cause of reduced shelf life. After a few days of exposure to the oxygen content of air, meat loses its freshness, taste, and visual appeal; it becomes un-saleable. Yet the purpose of case-ready meat is to lower costs and extend distribution. The only way to gain the advantages of case-ready meat is to use MAP. There are three basic MAP types for case-ready meat:

- Vacuum
- High-oxygen
- Low-oxygen

Vacuum Packaging

Vacuum packaging removes all the oxygen from the package, yet it has a major drawback — low visual appeal. For example, beef packed in a vacuum appears purple, not the rich, red color that consumers associate with fresh cut or ground beef.

High-Oxygen MAP

High-oxygen systems flood a package with nearly pure oxygen — 80 percent oxygen and 20 percent carbon dioxide. The oxygen produces a rich, red color and the carbon dioxide retards the growth of microbes. High-oxygen packaging extends the shelf life of case-ready meat to about nine days — four in dark storage and five in the retail case, on average.

A 2003 study conducted by Texas A & M University and funded by The Beef Checkoff reported, “Discoloration significantly increased as storage day(s) increased in the high-oxygen and PVC (non-MAP) packages.” Since appearance is important to consumers, the increasing discoloration of meat in high-oxygen systems is a major drawback.” The

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Texas A & M study also found that high-oxygen packaging “contribute(s) to premature browning when steaks are cooked.”

Another potential issue with high-oxygen packaging is that consumers seem to prefer purchasing case-ready meat in foam trays rather than in high-walled plastic containers typically used for high-oxygen MAP.

Low-Oxygen MAP

There are two methods of low-oxygen MAP — vacuum and back-flush, and scavenger. Vacuum and back-flush systems remove air from the package and replace it with a typical mixture of 70 percent nitrogen and 30 percent carbon dioxide. Sometimes these systems will include 0.4 percent carbon monoxide, which helps to maintain the red color. In vacuum and back-flush MAP, a number of trays are over-wrapped and hermetically sealed in a master bag. It is the atmosphere of the master bag that is modified, not the individual trays.

The Texas A & M study found that when compared to high-oxygen systems “steaks packaged in vacuum and back-flushed MAP had lower levels of discoloration during retail display and did not exhibit the premature browning effect (when cooking).” Shelf life for low-oxygen packed meat in the study ranged from five to nine days in dark storage and five days on the retail shelf. In vacuum and back-flush systems, a small amount of residual oxygen, approximately 0.5- to 2-percent, typically remains in the bag. This percentage of oxygen decreases shelf life.

A low-oxygen active MAP system can be used to either enhance or replace vacuum and back-flush MAP. This system uses an oxygen scavenger packet containing an absorbent formulation which literally scavenges the oxygen out of the master bag while simultaneously taking the oxygen out of the primary tray packs. Multisorb Technologies offers a scavenger product, FreshPax CR, which is designed specifically for case-ready meat applications. FreshPax CR reduces oxygen content in a master bag to below 0.1 percent and maintains this level despite oxygen ingress due to permeation. FreshPax CR meets Title 21 Code of Federal Regulations (CFR) standards for food-safe formulations.

After the FreshPax CR packet is inserted into the master bag and the bag is hermetically sealed, oxygen is significantly removed within 24 hours, thereby ensuring a re-bloom of red color once the master bag is

opened. FreshPax CR typically extends the shelf life of case-ready meat for 15 to 30 days, a significant potential extension over the 14-day shelf life of vacuum and back-flush MAP tested in the 2003 Texas A & M study.

FreshPax CR can be inserted into the same master bag that is vacuumed and back-flushed to ensure .01 percent oxygen or it can be utilized on its own to remove oxygen. Multisorb provides the optimum-sized FreshPax CR packet for each customer's case-ready meat application.

Multisorb provides the optimum-sized FreshPax CR packet for each customer's case-ready meat application. Multisorb's Active-Pak Automation (APA) division offers an economical method of automatically dispensing spooled scavengers to the master bag in a configuration easily adaptable to most tray and master bag lines. FreshPax CR, packed either for hand insertion or in spooled form for use with an APA dispenser, offers the lowest cost of entry into active MAP for case-ready meat.

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