

## Overview

In the first half of the century, fresh meat was processed into carcasses and sent to retail stores, where the carcasses were cut and packaged. In the 1960s, meat packers began offering “boxed beef” or “boxed meats.” Instead of receiving full carcasses, retail stores could order portions of the carcass (called “primals” and “sub-primals”) that were already vacuum-packaged and boxed.

This innovation made distribution easier because boxed could be stacked and handled more easily than full carcasses. The process of vacuum packaging the individual cuts made it much easier for manufacturers to control product aging so that meat products would arrive at the consumer’s table at the proper time and not before the proper amount of aging had occurred. It also made meat easier to handle at the retail level. In fact, the trend sparked an evolution into what we now call “case-ready” meat.

Case-ready meats are packaged at plants and delivered to retailers ready to be placed in the retail case. Unlike meat cut at the retail store – which carries only a retail brand – case-ready fresh meats carry a wide array of brands, which encourages companies to produce products that meet the highest possible safety and quality standards. Now, fresh products are readily identifiable and consumers can purchase the brands they like repeatedly, just as they’ve come to do with processed products like lunch meats, bacon and hot dogs for decades.

Case-ready meats are following the example of chicken, which has been sold packaged at the plant and bearing a brand name for decades.

Retailers sold an estimated 1.2 billion packages in 2000, more than double the number sold in 1997. Industry experts see the potential to sell nine billion packages.

## Benefits

For retailers, case-ready meats offer numerous benefits:

- Retail stores can order three cuts that sell in their

market and not a large carcass that includes cuts that don’t sell as well.

- Case-ready products arrive ready to go into the case and don’t require additional cutting or processing.
- Because these packages are produced and packaged at the plant, they have longer shelf lives than meat packaged in the retail store, which generally lasts about one to five days after it is opened, cut and repackaged.
- Case-ready products allow retail stores to manage inventory more effectively and reduce “out of stocks,” which are frustrating to consumers.
- Case-ready products allow retail stores to control unit costs, provide consistent products every day and key meat prices competitive with other foods.

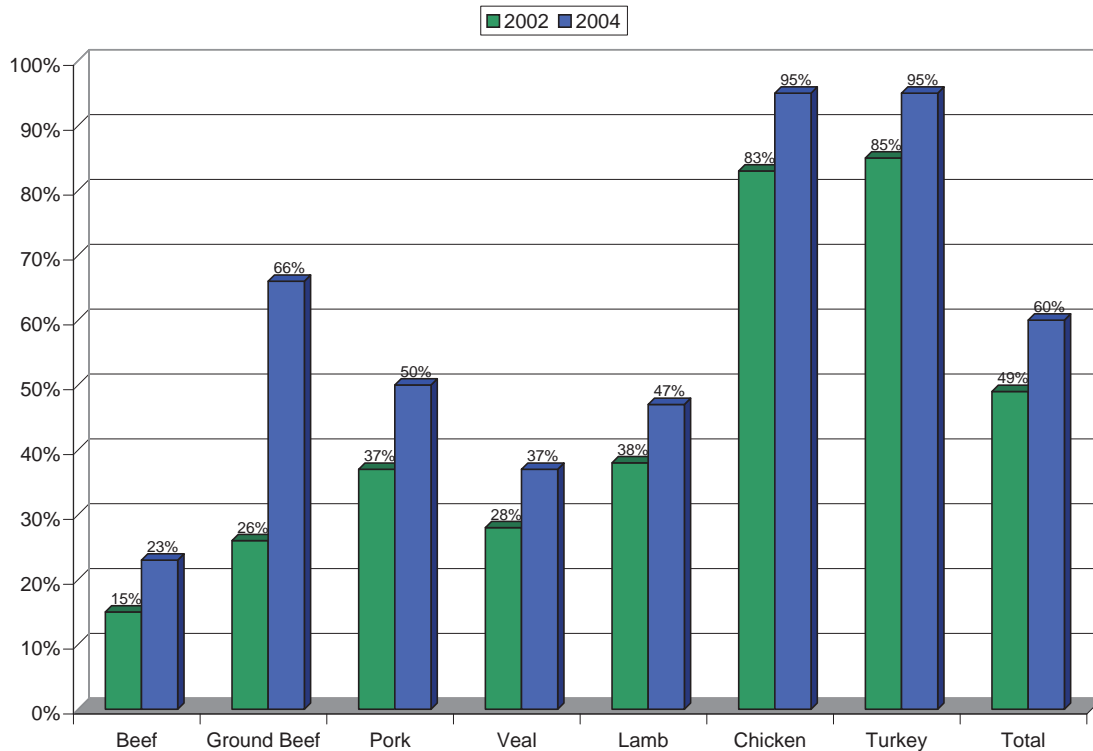
For consumers, case-ready meats also offer distinct benefits:

- Many case-ready meats are packaged in tamper-proof packages, which can offer consumers additional measure of confidence.
- Case-ready packaging is leak-proof and easily stackable in refrigerators and freezers.
- Fewer human hands touch case-ready meats because they are produced and packaged in a plant under the oversight of federal inspectors from the U.S. Department of Agriculture.
- Because these products are often branded, consumers can easily identify products for which they have developed a loyalty based upon individual tastes and features, which makes purchasing decisions easier.
- Case-ready processing and packaging allows for precise control of product aging, which can enhance the consumer eating experience.
- Low-oxygen packaging of case-ready allows for the elimination of oxygen, which causes off-flavors, off-color and off-odor.

## The Science of Consumer Ready Packaging

Case-ready meats are typically sold in one of two ways: vacuum packaged, in which the plastic packaging fits snugly around the meat and oxygen is “vacuumed out” or in modified atmosphere packaging (MAP).

### Case Ready Penetration By Species Based on Package Counts



Source: 2004 National Meat Case Study, All Rights Reserved

**Vacuum packaging** removes all oxygen from meat products, which prevents oxidation of the product. Oxidation can lead to a decline in flavor and color and can prompt an odor around the product. Vacuum packaged products appear in their “true” color, a dark reddish-purple for beef and a dark pink for pork.

Consumer response to this natural color has not always been favorable, however, because many equate bright red beef or bright pink pork with freshness. Some retailers have moved to vacuum packaged beef and pork with great success through a detailed consumer education program. Aside from providing a significantly longer shelf life of the product, vacuum packaging also eliminates freezer burn.

**Modified atmosphere packages (MAP)** are tamper-proof packages that leave a space between the meat on the tray and the top of the package. Various combinations of gases can be added to this space, including oxygen, nitrogen, carbon monoxide and carbon dioxide. These are flushed into the package at very specific ratios in order to achieve a desired effect. The specific atmospheric gases used in MAP have a long history of safe use in food packaging.

In 2002, the use of carbon monoxide in very small amounts in fresh beef and pork packages was given “Generally Recognized as Safe” (or GRAS) status by the U.S. Food and Drug Administration. The levels of CO permitted are actually less than the level permitted by the U.S. Environmental Protection Agency in the air we breathe.

**Low-oxygen MAP** is another method used to package beef and pork products. The process utilizes a combination of nitrogen, carbon dioxide and carbon monoxide and maintains the color of the product consumers expect. Nitrogen is an inert gas that functions to fill headspaces in the package. Carbon dioxide is added for its antimicrobial properties and carbon monoxide stabilizes the typical red or pink color of air-exposed meat. The benefits of removing oxygen from carbon monoxide-MAP packages are similar to that of vacuum packaging.

Both oxygen and carbon monoxide maintain the pigments of meat in the characteristic red (beef) or pink (pork) color, which is often referred to as “bloom.” The use of high-oxygen MAP has been widely used in the marketplace because of the desirable color that is caused by the oxygen-rich environments. However, the shelf life of these systems is significantly shorter

because the presence of oxygen negatively affects quality traits, such as flavor, color and odor.

Processors use a variety of gas combination strategies, including high-oxygen, low-oxygen, or vacuum packaging. The packaging format chosen depends on a variety of factors such as tray or package configuration, meat cut type and size, distribution life required, retail case-life required, consumer expectations and cost. No one particular system fits all of the needs in the marketplace.

## Availability

A 2004 study conducted by the Cryovac Division, Sealed Air Corporation, the National Cattlemen's Beef Association and the National Pork Board assessed case-ready product in meat cases across the country. The National Meat Case Study found that case-ready products have grown to 60 percent of the meat case. This is up from 49 percent in 2002. The chart on the previous page shows the break down by species.

## Glossary of Terms

**Aging** – The process of holding meat cuts for a controlled period of time after harvest to allow for proper development of flavor and improvement of tenderness.

**Boxed Meat** – Meat that is cut down from the original carcass into portions called primals and sub-primals. The cuts are then vacuum-packaged and boxed. These proportions are further cut down upon arrival at retail stores and restaurants.

**Case-ready** – The broad term for any meat that is packaged in a meat processing plant and ready to be placed directly into display cases upon arrival at a retail store.

**Vacuum Packaged** – These products are sold in a tightly sealed packaging where air has been “vacuumed out.” The removal of oxygen-rich air extends shelf life; however, it causes meat to appear in its natural color: purple.

**Modified atmosphere packaging** – Products sold “case-ready” are often sold in packages that have been designed to contain unique mixtures of various gases. This process can help to maintain flavor, color and odor and can prevent spoilage. Certain gases are anti-microbial.

**Bloom** – Meat is naturally purple in the absence of oxygen. However, when the meat comes into contact with oxygen, it turns a bright red, which is referred to as “bloom.”

**Oxidation** – Oxidation refers to chemical reactions that occur in the presence of oxygen. Just like paint on a car can “oxidize” and become faded or dull, a sliced apple or fresh red meat oxidizes in the presence of air and becomes brown in color. Oxidation also leads to development of off-flavor and off-odors, known as rancidity.

**Value-Added** – Some case-ready products are also referred to as “value-added” products because adding marinades, stuffing or other valuable ingredients has enhanced them. In some cases, these products are raw and need to be cooked thoroughly. In other cases, companies are providing partially cooked or fully cooked heat-and-eat products, like precooked pot roasts that need only be heated through.

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## Helpful Links

**American Meat Institute**  
<http://www.meatami.com>  
<http://www.meatsafety.org>

## Third-Party Experts

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