queried the group concerning whether the five-point color scale in the NPPC Evaluation Book places the illustrated colors as the midpoint of each level. The assumption is that these are indeed midpoint hues.

Dark Cutters, Blood Splash and Bruising in the Value Pricing Classes

Due to the extended discussions on other subjects, little time was left for this topic. A general summary of opinions was that as with all new aspects of the judging format, time will allow for the best interpretation of how extreme these defects will need to be to be “obvious” and therefore of significance in ranking considerations.

---

**Case-Ready Packaging**

**E. SUSANNE TROUTT***

**Introduction**

Case-Ready Packaging (CRP) deals with centrally-prepared food products including fresh beef, pork, lamb, veal, fresh poultry, smoked and processed meats, cooked poultry, cheese, deli items and value-added products. Case-ready packaging should be considered because of increasing pressure on retailers due to competition, cost reduction, food safety and skilled labor. In addition, CRP offers variety and convenience, consistent products and reduces labor for more time to merchandise. Case-Ready Packaging benefits include: product uniformity, less in-store shrink, better inventory control at retail, product variety, convenience, more time for merchandising, may increase shelf life, reduce food safety risks at retail and reduced out of stocks, thus producing increased sales.

**Factors to Consider**

Technical factors to consider in CRP are gas mixtures, oxygen absorbers, microbial growth, pathogens, color life, sensory and packaging characteristics. Other factors to consider could be retailer and consumer needs, marketing, sales, operations and labeling. In gas mixtures, N₂ is used as a filler, O₂ provides the red “bloomed” color and accelerates lipid oxidation and CO₂ helps retard microbial growth and has effects on absorption and color in certain products. Combinations of these three are used, depending on the product and safety concerns of the product. Oxygen absorbers are used to maintain low oxygen environment in low-oxygen packaging.

Microbial factors include: initial microbial load, fresh versus cooked products, intact muscle versus ground muscle, temperature, sanitation and storage time. Low-oxygen packaging is generally used in processed and prepared foods to guard against pathogens. The oxygenated state of the product is a technical factor to consider when looking at color of fresh versus smoked and processed meat. Technical factors involving sensory are: odor due to bacteria and lipid oxidation, flavor due to lipid oxidation and aging, as well as texture and acceptability. Packaging factors include: purge control, gas permeability, clarity, antifog, residual gasses and barrier properties. Marketing, sales and operations each have additional technical factors. Marketing looks at convenience, value added, information provided on package, consistency and brand identity. Sales should partner with the retailer to be most successful and operations should have different prod-
ucts depending upon the operation. Finally, packaging and labeling factors include nutritional labeling, cooking instructions and recipes, pre-weight and pricing, and depend upon retail, consumer and technical goals.

**Case-Ready Packaging Systems**

Systems available for modified atmosphere technology include: vacuum packaging (anaerobic), low oxygen MAP (anaerobic), high oxygen MAP (aerobic), gas exchange technology (anaerobic to aerobic) and removable barrier films (anaerobic to aerobic). Each of these package types accomplishes different objectives in reaching the goals of the packer, retailer and consumer. Furthermore, each package type accomplishes different technical goals.

Vacuum packaging includes three types: vacuum skin package (semi-rigid and flexible), skin package and thermoform laminate package. Vacuum skin packaging produces a purple color in red meat due to the barrier film. It eliminates moisture leakage from the package, and increases shelf life through distribution and retail. Furthermore, vacuum skin packaging improves purge control, reduces shrink and out of stocks, gives a 3-D presentation, has EZ open capabilities and can include print. Skin packaging gives the same purple color, also eliminates moisture leakage, extends shelf life and can include printing. However, skin packaging doesn’t prevent purge as well, has no 3-D effect and can have wrinkles on corners of film. Thermoform laminates have many of the same advantages as do the vacuum skin package; however, they will have more purge than vacuum skin.

Modified-atmosphere packaging includes: thermoform laminate, barrier form trays with lidding, non-foam trays with lidding, stretch shrink over wrap or PVC and masterpack, barrier shrink film (foam trays, non foam trays and unsupported). Thermoform laminates can be designed to give red oxymyoglobin or deoxymyoglobin color. Thermoform laminates eliminate moisture leakage, increase shelf life, provide EZ open capabilities and can include printing. Barrier Foaming packaging may or may not include foam tray along with barrier lidstock. They provide increased shelf life, self-contained packaging and can include printing. In addition, barrier foams eliminate purge. Barrier foam gives in-store look with headspace on high oxygen only. Stretch shrink-overwrap and masterpack are used for high oxygen only. They provide shorter shelf life, give in-store look with full trays and no headspace. Also, this type of package allows case replacements without the consumer noticing and are virtually leak-proof. Barrier film over wrap eliminates moisture leakage, gives in-store look with headspace on high-oxygen package only. In addition they provide increased shelf life, are self-contained packaging, use foam trays, use oxygen absorbers, can use ovenable trays, are unsupported and can include printing.

Gas exchange technology allows purple color to convert to red color. This type of package eliminates package leaks, give in-store look with minimal headspace, increases shelf life, reduces shrink and out-of-stocks and can be altered to leave low oxygen or convert to high oxygen. Removal Barrier Film packages are peelable vacuum skin packages with a removable top film layer that allows purple color to convert to red color. This should increase shelf life, reduce shrink and out-of-stocks, control purge, maintain low oxygen or convert to high oxygen and eliminates moisture leakage.

In conclusion, there are a variety of CRP systems available. The specific needs of the retailer and consumer should be matched with the systems’ objectives. Research continues in all of these areas in all disciplines. Furthermore, food safety and HACCP are top priority. Education for both consumer and retailer is a very important component to the success of the system. All meat cases may contain a variety of these package types and some cases may be solely centrally packaged case-ready packaging.

**Discussion**

Are peelable films being used anywhere in the marketplace and do costs compare?

Two markets are currently using this package with 150-200 stores. There are several studies into the total case cost and so far they look favorable.

Compare shelf life of low O2 to high O2 packaging.

Steaks in low O2 have similar shelf life to vacuum packaging. Beef in high O2 (80/20) ranges for whole muscle of 12-14 days to 6-10 days in ground beef.

Will Masterpack shorten self life in the retail case?

Masterpack provides extra shelf life up front; however, it may shorten retail shelf life.

Which O2 scavengers are the best?

There are several, and each one depends on the special criteria and characteristics of the products. Average cost for small ones are 2¢ to 10-15¢.

What might the future be?

O2 absorbers and anti-microbial in packaging materials.

Any interest in preseasoned fresh meat and marinated packaging?

In-house work account by account or customer by customer. Customers want convenience, quality and are paying more attention to food safety. They also want to investigate chef preparation in the back of the deli.