BEST PRACTICES

Cook-in-bag preparations: How to do it right

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Cook-in-bag and film preparations are increasing in volume due to the demand for convenience, food safety, throughput, yield and shelf-life. Ingredient technology, packaging, and processing parameters are application specific and need to be optimized to ensure quality and maximize yield.

It is essential to start with high-quality, functional raw material. For example, any defect such as pale, soft and exudative pork or poultry will lead to finished product defects since functional meat protein in raw material leads to acceptable finished products.

Traditional water-cook bags and thermoformed films

The most common cook-in bags are for cook-in-chill, cook-in-ship, and cook-in-strip applications. For these applications, choosing the correct package is essential. In cook-chill or cook-freeze applications, bags or thermoformed roll stock film must withstand temperatures in the range that the product will be cooked and stored. In cook-chill applications, products need to be chilled rapidly to maintain quality and flavor.

Heat shrink bags that are used for these applications must have the appropriate moisture and oxygen barriers and mechanical resistance properties. Non-adhesive bags, also referred to as no-cling bags, can be used for whole muscle beef, turkey breast or whole birds since some non-adhesive bags allow for controlled moisture loss during cooking. Non-adhesion bags or thermoformed film can also be used for cook-freeze applications if the appropriate multi-ply material is used.

Thermoformed films with adhesion properties (cling properties) can also be used for cook-in-poultry and cook-in ham applications to improve yields when compared to

non-adhesive no-cling films. One supplier produces films for adhesion applications for cook-in-poultry products and bone-in hams that are designed for use with their thermoforming packaging machines. When using adhesive packaging, it is crucial to formulate marinade or brine solutions such that cost is minimized and yields are optimized.

Multi-layer cook-in casings can be used to optimize yields in deli hams and turkey rolls in food service applications. Another supplier has developed a cook-in bag with barrier properties that can withstand a temperature of 210o F. This package can be used for cook-in bag applications and/or post-package pasteurization of products.

Cook-in-strip packaging allows processors to open bags without knives, which can reduce cross-contamination and improve worker safety. This application is commonly used for roast beef, turkey and ham in convenience applications with limited utensil use or availability. In addition, rollstock films are available for products such as deli meats, which make it convenient for the processor to cook in thermoformed films and integrate packaging equipment and material for specific applications.Many bags are designed to withstand high temperatures so that they can be used for post-pasteurization treatments to enhance safety in ready-to eat products.

Oven bags

Oven cooking bags have been developed to withstand temperatures of 375 oF to 450oF. These packages can be used to cook product during initial processing in the plant and can be used to package raw, seasoned ready-to-cook products for consumers or foodservice establishments.

Oven bags are also available to heat products such as ribs, which add convenience for foodservice establishments. The most recent introduction of this application is used by Farmland for their OvenPerfect tenderloin and loins. Other examples of these cook-in applications are used for roasts, ribs, tenderloins and poultry.

Specific applications: Deli products

Deli meat products are commonly water-cooked in shrink bags with meat adhesion (also called cling) properties. The adhesion properties prevent purge in the package and impart a desirable skin appearance. Ingredient formulations commonly include water or broth, salt, sodium phosphates and dextrose. The percentage salt and type of phosphate blend are important variables that need to be optimized in product development applications.

For example, using a specific blend of phosphates with an alkaline pH may be more expensive than using a more traditional specific phosphate product but the phosphate blend product may increase yields, quality and profits.

To maximize yields in deli applications, carrageenan, sodium caseinate, soy protein concentrate and/or modified food starch are often used. Carrageenan is an important functional ingredient when high concentrations of water are used in the formulation and products are to be thinly sliced. For carrageenan, a 0.3-0.5-percent mixture of kappa and iota carrageenan will enhance yields, texture and sliceability – but it is crucial that the most appropriate carrageenan product is used in the formulation.

Modified food starches can be used for two functions. An instant starch can bind water to aid in initial processing if it is a slurried product. An additional modified starch

can be used to bind water and improve slicing yield. The most important factor in choosing this starch system is to make sure that the starch gelatinization temperature is lower than the final internal processing temperature of the meat product but does not break down before the final temperature is reached. It should also be considered if the starch is compatible with the storage temperatures of the product, especially if the product is frozen and potentially exposed to multiple freeze thaw cycles.

Important processing factors in water cook applications

The correct amount of pressure must be applied (if a mold is used), the temperature of the water must increase slowly and the appropriate endpoint temperature must be reached.

If the endpoint temperature is too low, the texture will be unacceptable due to lack of protein coagulation, and it will create a food safety hazard. If the endpoint temperature is too high, there will be an undesirable dry texture. If the temperature of the water is too high, there will be decreased yields and poor product quality and possible damage to the cook-in bag.

Conclusion

There is a market opportunity for cook-in technology with bags and thermoformed films.

In these applications, it is important to work with packaging companies to choose the most appropriate bag, film and packaging equipment for your application.

In addition, it is crucial to be certain that the cook-in material is compatible with storage temperatures and to have an optimized process and consistency in that process to maximize product quality, yields and profits.

Byron Williams and Yan Zhao also contributed to this article.