

The recipe for safer food



There are products on the market that can assist with pathogen reduction
in addition to shelf life extension.

In 2015, 902 foodborne disease outbreaks were reported in the US. This resulted in 15,202 illnesses, 950 hospitalizations, 15 deaths and 20 food recalls, according to the most recent data from the Centers for Disease Control (CDC) and Prevention, Atlanta. Seeded vegetables were the No. 1 food category associated with outbreak illnesses, followed by pork, which was responsible for 924 illnesses from 19 outbreaks. Chicken had more outbreaks (22), while it was a comparatively quiet year for beef-related outbreaks.

“The CDC attributes three primary modes of failure for all foodborne disease outbreaks,” says Roger Maehler, senior director, seasoning research and development, Newly Weds Foods, Chicago. “The first is contamination, from post-cook cross contamination or the failure of decontamination. Then there’s proliferation, which is almost exclusively from non-compliant cold or hot holding. And lastly there’s survival, which is almost exclusively from non-compliant cooking processes.”

Many processors focus on decontamination of the carcass, as it makes sense to start with the cleanest possible raw materials. Cleaning is often achieved by using inexpensive chemical process aids that are not declared on ingredient statements. Decontamination is also important in order to meet federal guidelines and performance standards.

“While this approach is a good start, processors’ preventative measures cannot stop here,” Maehler says. “Decontaminating process aids are incapable of delivering completely safe ready-to-eat (RTE) products. By definition and regulatory requirement, these process aids cannot have any downstream functionality with regard to limiting growth or ensuring destruction when cooked.”

Addressing the hazards

Almost all (about 95 percent) foodborne disease outbreaks where meat and poultry are identified as the potential vehicle, are the result of undercooking, pathogen proliferation or cross contamination, according to CDC data. Decontamination is paramount, but not enough. A comprehensive food safety plan for meat and poultry products must address all hazards before, during and after the products leave the manufacturing facility.

“If you want to attack the other 95 percent of causative factors, you need pathogen proliferation control when notoriously unreliable refrigeration fails,” Maehler says. “You also need something to assist end-users to achieve a validated kill step outside of the tight constraints of a HACCP-controlled cook factory and something to reduce the potential for cross contamination in a home kitchen and foodservice.”

Lactates, propionic acid and acetic acid are all organic acids that are effective at controlling pathogen growth. Propionic acid is recognized as being the most effective of these acids; while vinegar, a natural source of acetic acid, is where a great deal of innovation has been taking place. This is because vinegar is an ingredient consumers understand and don't view as a chemical preservative; thus, it is viewed as a clean-label ingredient.

Newly Weds Foods offers proprietary combinations of vinegar and spice extractives. The ingredients inhibit pathogen proliferation throughout product processing and distribution, reduce potential for cross-contamination and enhance *Escherichia coli* and *Salmonella* susceptibility to heat. The ingredients are sourced from nature, with organic and non-GMO options available. The easy-to-use liquid is applied directly to ground products and to whole muscle meats by marination. It does not impact food flavor or overall product quality.

“For raw beef and poultry applications, we suggest a usage level of 1 percent. This amount has demonstrated complete pathogen inhibition for up to a full month even when stored at 45° F, where exponential pathogen growth in controls is seen in less than two weeks,” Maehler says. “The extracts have also been shown to increase pathogen reduction by more than 90 percent at temperatures in the high 120s (degrees F) to low 130s (degrees F), where meat and poultry begins to look cooked but has not achieved the USDA-recommended kill level.”

World Technology Ingredients (WTI) Inc., Jefferson, Georgia, offers a range of functional ingredients for pathogen control, including liquids and powders, low-sodium or sodium-free options, clean label, natural, organic and non-GMO ingredients. All products inhibit the growth of *Listeria monocytogenes*, as well as other pathogens and spoilage organisms, thereby increasing food safety and extending shelf life.

“Our ingredients can be added directly into a food product or used as a topical treatment,” says Klaus Kreuzner, director of sales at WTI. “Our products are designed to inhibit Listeria growth in ready-to-eat items. We have conducted studies with our vinegars and achieved 70 to 90 days without Listeria growth at 0.5 to 0.7 percent usage rates.”