

Controlling contaminants

Detection systems and preventative techniques can protect food from foreign material contamination

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Food recalls occur for countless reasons – the most extreme being when foodborne pathogens contaminate a food supply. **But recently more common are cases of the detection of a foreign material contaminant in a food product.**

In early September, Kenosha Beef International LTD recalled approximately 89,235 lbs. of pork sausage patty products that were contaminated with extraneous materials. The problem was discovered after the Kenosha, Wis.-based establishment began receiving consumer complaints **that small pieces of metal were being found in the products.**

In late September, a poultry processing plant owned by Laurel, Miss.-based Sanderson Farms Inc., launched a recall of 551,090 lbs. of chicken parts on concerns the products were contaminated by foreign matter. The US Dept. of Agriculture's Food Safety and Inspection Service (FSIS) said a further processor alerted Sanderson to the problem after finding metal shavings in the chicken. Sanderson investigated the matter, and found that the contamination occurred due to a malfunctioning ice-making machine used during production.

According to FSIS, "possible foreign matter detection" was the cause for the recall of approximately 241,000 lbs. of products in 2014 and 784,000 lbs. in 2015. Cases cited involved products suspected to contain glass, **metal** and "extraneous materials."

When it comes to foreign material contaminants in food, there are many that can be cause for concern and potential recall.

"Any extraneous object or foreign matter in a food item which may cause illness or injury to a person consuming the product is considered a foreign material contaminant," says Jude Mason, director of technical and consulting services for NSF International. "These foreign objects include but are not limited to bone or bone chips, **metal flakes or fragments**, pieces of product packaging, stones, glass or wood fragments, insects, personal items, or any other foreign material not normally found in food products."

When it comes to meat-processing plants, bones or bone chips are the most common sources of foreign matter, Mason says. In addition, there can be situations of contamination from material such as metal or string that has been eaten by the animal or even broken needles from veterinary treatments or from injection. **Possible sources of physical contamination during meat production include metal from rails**, clips, tags or machinery; knife blades; grease, **oil**, paint flakes or **rust**; plastic; contaminants from employees such as rubber bands, jewelry, pens, buttons or hair; glass splinters; bone splinters; wood splinters; sawdust; dust; dead insects and animal droppings, Mason says.

DETECTION AND PREVENTION

To reduce the potential for contaminants to slip through the cracks during the production process, or to be introduced at any point during the process, **manufacturers should take on a start-to-finish approach to prevention,**

Mason says. This approach involves equipment maintenance and control during every stage of production, ingredient selection, and employee training and monitoring.

Working closely with ingredient suppliers to ensure they also have appropriate detection methods in place is a crucial, often overlooked step in the process. Introducing ingredients into meat products that could be contaminated themselves just makes the detection and prevention process more challenging for meat processors.

The primary object detection technologies used to detect such foreign contaminants include metal detection, x-ray detection and visible/infrared imaging systems. Each technology has its strengths and limits. Metal detectors are obviously effective at detecting metal contaminants such as broken-off pieces of equipment or other metallic objects, but aren't necessarily helpful in finding bone fragments and other non-metal material like plastic. Imaging systems are helpful to detect foreign material on exposed portions of meat. And, x-ray detection technologies can find both metallic and non-metallic contaminants, although there is no guarantee that every contaminant can be detected with x-ray.

Aside from specific detection technologies used to find contaminants during processing, manufacturers should employ preventative practices. This involves inspecting equipment regularly to ensure there are no loose pieces that could fall off during production. Visual inspection at various stages of production should also be employed, Mason says.

Mason recommends using the Hazard Analysis and Critical Control Points (HACCP)

approach to identify any potential food safety hazards and threats of contamination. Using the seven-step method, processors can:

- identify any hazards that could lead to product contamination that must be prevented, eliminated or reduced;
- identify critical control points (CCPs) at the steps at which control is essential;
- establish critical limits at the control points;
- establish procedures to monitor the CCPs;
- establish necessary corrective actions;
- establish procedures to verify whether the corrective actions are working effectively; and
- establish documents and records to demonstrate the effective application of the above procedures and corrective measures.

"The HACCP approach provides a systematic way of identifying food safety hazards and making sure that they are being controlled day-in and day-out," she says.

Third-party auditors can also control contaminants during the production process. "Third-party auditors can conduct independent foreign object audits and checks highlighting areas of potential risk to allow processors to rectify the risk before an issue occurs," Mason says. "Third-party auditors can also help to validate the HACCP process, including a check that records and control methods are in place and adequate."

Regardless of method or methods of detection and inspection a food plant employs, it is essential to train employees properly in all aspects of their jobs. Wearing the appropriate clothing and personal protective equipment – or not wearing particular things such as jewelry, watches and hair clips – can protect product from unnecessary contamination. 

According to FSIS, "possible foreign matter detection" was the cause for the recall of approximately 784,000 lbs. of products in 2015.