Development of whole chain traceability systems to increase the safety of the foods we eat

Issue

The number one concern for the public, regulators and food safety researchers is to continue to reduce the risks from food borne illness. Food safety is one of the fundamental factors that makes whole-chain traceability increasingly important to the food industry. The CDC estimates that 1 in every 6 US consumers gets sick (48 million people), 128,000 are hospitalized and needlessly 3,000 person die of foodborne illness each year! [http://www.cdc.gov/foodborneburden/] Only when we have an efficient tracking system is it possible to have a rapid and complete product recall. Today, many segments of the food industry have at least some traceability capacity for their products, but the beef industry has been resistant and appears to have little motivation to adopt whole-chain traceability. In fact FDA has been soundly criticized for their lack of leadership in providing guidance to the industry.

“To date, the agency has failed to meet each deadline (according to FSMA’s implementation) and continues to delay implementation of a recall notification system required by law and crucial for consumer safety,” wrote David Plunkett, senior staff attorney for CSPI's (Center for Science in the Public Interest) Food Safety Program [http://www.foodsafetynews.com/2015/05/cspi-chastises-fda-for-lack-of-recall-notification-guidance-required-by-fsma/#.VmBcN3arThc]

Action

A whole chain traceability system (WCTS) for the beef industry would improve food safety, improve animal disease traceability, improve supply chain management, and enhance value-added opportunities and communication between producers and consumers. On the major beef exporting countries, only the United States does not have a WCTS for beef.

USDA funded a multi-institution (Oklahoma State University, University of Arkansas, and the Noble Foundation), multidisciplinary research project to develop a pilot WCTS that would address producers concerns about cost, confidentiality, and liability. As part of this project, a National Whole Chain Traceability Institute (NWCTI) has been formed. PIs on this proposal have made presentations to the Arkansas Beef Association among other stakeholder groups. The WCTS technology developed as part of this project forms the backbone of the NWCTI, and is able to resolve the confidentiality concern, in addition to providing a framework to increase value-added opportunities to producers and address liability issues.

Listeria monocytogenes continues to be the most fatal of the foodborne illnesses in the US today

Issue

Foodborne listeriosis infections are primarily caused by ingestion of contaminated, ready-to-eat (RTE) foods with microbial risk assessments implicating RTE luncheon meats slices in the deli as the highest risk category.
Preliminary FoodNet data on the incidence of foodborne illnesses for the United States in 2001 indicated that the incidence of infection from *Listeria monocytogenes* decreased between 1996 and 2001 from 0.5 to 0.3 cases per 100,000 people per year. The level then reached a plateau.

http://www.fda.gov/Food/FoodScienceResearch/RiskSafetyAssessment/ucm183966.htm

Retail delis often buy RTE meats unsliced and slice them in front of customers; these meats sliced in the deli cause more than ¾ of the foodborne listeriosis cases. It has been postulated that putting *Listeria* specific antimicrobials in RTE luncheon meats to be sliced in retail delis would lower the risk to consumers by as much as 96%, especially for high-risk consumers which includes the elderly, immune compromised, pregnant women and children under 5 years of age.

**Action**

Recently a large retailer of RTE meats sliced in their delis required all of their suppliers of bulk RTE meats which could support the growth of *Listeria* and which would be sliced in their delis to include a verified *Listeria* inhibitor in their meat formulation. With the help of this retailer, we surveyed these suppliers and determined that prior to the retailers’ requirement nearly half of the suppliers did not use a microbial inhibitor in their bulk luncheon meat. We asked whether, after going to the expense of reformulating their products for these specific retailers, these suppliers subsequently added inhibitors to all bulk luncheon meats regardless of customer. Surprisingly, 80% reported that they did not. In the future, retailers should be approached to encourage them to require their suppliers to include inhibitors in the bulk luncheon meats that they purchase since it seems that retailers can have a large impact on the way foods are formulated.

**Increasing hand hygiene compliance of foodservice workers and consumers**

**Issue**

Lack of hand washing or improper hand washing is a major contributor to foodborne illness outbreaks each year. Other researchers have determined that only 1/3 of food service workers attempt to wash their hands when required by regulations to do so, and only 1/3 of those who try wash their hands properly. This results in an overall compliance rate of slightly more than 10%!

We have attempted to determine the barriers to motivation of proper hand hygiene compliance.

**Action**

We designed a study to determine the influence of disgust and other motives on hand washing among participants when handling common foods in the foodservice industry, and to determine if these responses are culturally dependent. Caucasian and Hispanic volunteers were observed while they handled four common foods; apple, bread, chicken and fish. We determined that hand washing behavior was affected by the type of food being handled and the intensity of the emotion of disgust. The volunteers tended to wash their hands more frequently for foods they perceived as more hazardous after handling raw chicken or fish. The reason for hand washing varied for gender, culture and the type of food. We also noted that as the person felt more disgust for the food handled they had a higher probability to wash their hands. We are following-up on this line of research to look for ways to apply these findings in the real world.