

Controlling *Listeria monocytogenes* on Ready-to-Eat Meat and Poultry Products

I. Innovative Pathogen Intervention Technologies

- Identify and validate bactericidal and/or bacteriostatic ingredients or treatments. Proposals should address existing FSIS and FDA regulations (e.g. FSIS Supplementary Guidance - http://www.fsis.usda.gov/OPPDE/rdad/FRPubs/97-013F/Lm_Supplementary_Guidance.pdf, FDA approval status). Additionally, proposals should define the meaning of bacteriostatic and bacteriocidal in the context of existing regulations. Proposals should include an evaluation of the impact on sensory attributes, cost and application method.
- Identify factors involved in regulation of genes that influence the organism's ability to thrive in RTE processing environments, on food contact surfaces and/or on products. Identify potential synergistic effects of existing hurdles related to gene expression. Proposals should include an evaluation of differences among serotypes and impact of meat species type.

II. Operational Control and Monitoring of the Processing Environment

- Identify methods of preventing microbiological recontamination of sliced, diced, chopped and/or shredded meats.
- Validate the expected impact of operational controls such as clean room technologies, facility and equipment cleaning procedures.
- Develop and validate measures of effectiveness of existing controls. Proposals should address issues specific to small and very small plants.
- Evaluate real-time or near real-time *Listeria* sampling and testing technologies.
- Develop improved and validated quantitative methods for *L. monocytogenes* detection in foods and environmental samples.

Controlling *Escherichia coli* O157:H7 in Fresh Beef Products

I. Pre-Harvest Research (Pre-harvest is defined as the time period prior to cattle being placed on the trailer for transport to the slaughter facility.)

- Develop greater understanding of the ecology/epidemiology of *E. coli* O157:H7 as well as non-O157 Shiga-toxin producing *E. coli* (STEC).
- Determine the mechanism for intestinal colonization of *E. coli* O157:H7 and STEC and corresponding opportunities for control.

II. Post-Harvest Research

- Validate the critical components of the Beef Industry Food Safety Council’s “Best Practices: Pathogen Control during Tenderizing/Enhancing of Whole Muscle Cuts” (http://www.bifsc.org/uDocs/03_29_06%20Non-Intact%20Best%20Practices.pdf, <http://www.bifsc.org/meetNon-IntactProductProcessingWorkshop.aspx>) by determining the cumulative effect of standard intervention practices including integrated lethality of cooking processes.
- Lairage has been identified as a risk factor for *E. coli* O157:H7 contamination of hides for cattle delivered to processing plants. Proposals should identify practical intervention technologies to reduce levels of *E. coli* O157:H7 at lairage.
- Identify and validate novel intervention technologies for *E. coli* O157:H7.
- Evaluate the effect of the plant environment (e.g. air, machinery, employees) in the role of transmission of *E. coli* O157:H7.
- Determine a novel method of reducing transfer of *E. coli* O157:H7 from hide to the carcass.
- Develop easy to adopt hide treatment technology to reduce *E. coli* O157:H7 load on cattle presented for harvest.
- Validate existing and commonly used intervention technologies for *E. coli* O157:H7.
- Evaluate the statistical validity of existing and alternative sampling methods for *E. coli* O157:H7 in beef trim and finished products.

III. Information to Enhance Current and Future *E. coli* O157:H7 Risk Assessments

- Address data needs identified in the FSIS Draft Risk Assessment for *E. coli* O157:H7.
- Conduct an analysis of the combination of virulence factors required to cause human illness.
- Develop data to support future risk assessments of *E. coli* O157:H7 and STEC and to estimate the human health risk attributable to beef products.

Controlling *Salmonella* in Meat and Poultry Products

I. Innovative Pathogen Intervention Technologies

- Investigate and validate novel intervention technologies for *Salmonella* in meat and poultry products.
- Determine the effectiveness of existing or new intervention technologies on multiple serovars of *Salmonella* including those that are multi-drug resistant.
- Identify the potential for *Salmonella* harbors within the post-harvest processing environment and interventions to reduce or eliminate the presence of *Salmonella* in the identified harbors.
- Identify likely sources of contamination, risk factors, and how to systematically intervene at the production facility, during transportation and lairage and the levels of *Salmonella* present on carcasses and meat products.

II. Information to Enhance Current and Future *Salmonella* Public Health Risk Assessments

- Develop quantitative sampling and analytical methods for *Salmonella* on raw meat and poultry products that will provide meaningful data for enhancing public health.
- Investigate the epidemiology of multi-drug resistant *Salmonella* within production and quantify the human health risks associated with these organisms.

Targeted Research

AMI member companies have identified very specific targeted research needs that will assist the industry in solving unique technical challenges within meat and poultry facilities. These targeted projects have been specifically suggested by AMI member companies and some detail concerning project scope has been provided. These projects will be considered for funding along with projects submitted for other research priority areas. In some cases, these targeted projects may overlap with the general research priority areas listed above. If you choose to submit a proposal to address one or more of these projects, please reference this intent in the pre-proposal.

Develop white paper on non-O157 shiga-toxin producing *E. coli* (STEC).

The proposal should include the following:

- Assessment of detection methodologies;
- Evaluation of prevalence in meat and non-meat sources;
- Human illness cases attributed meat and non-meat sources; and
- Effectiveness of existing interventions.

Evaluate the effectiveness of existing interventions such as thermal processing, SSOPs and GMPs, and chemical interventions on virus inactivation in meat and poultry products.

The project should result in a white paper that could be used by the meat and poultry industry as supporting validation materials for HACCP plans. The proposal should consider the following:

- Comprehensive literature review to assess what is currently known and any potential data gaps.
- Viruses associated with animal disease (*e.g.* Porcine Reproductive and Respiratory Syndrome Virus (PRRS), Porcine circovirus type 2 (PCV2))
- Viruses associated with human disease (*e.g.* Norovirus, Hepatitis)

Improve and augment epidemiological data on food attribution for listeriosis, both sporadic and outbreak cases.

The proposal should recognize the following assumptions:

- The Food and Drug Administration/Food Safety and Inspection Service *Listeria* Risk Assessment indicate ready-to-eat deli items are responsible for a majority of foodborne listeriosis cases in the U.S.
- USDA's Food Safety and Inspection Service data indicate the prevalence of *Listeria monocytogenes* on RTE meat and poultry products has been declining from 2.54% contamination rate in 1998 to 0.61% in 2006, while the Centers for Disease Control and Prevention 2006 FoodNet data indicate listeriosis cases only declined from 5 cases/million in 1996 to 2.7 cases/million in 2007. If a majority of the listeriosis cases are indeed caused by contaminated deli meats, a much more considerable decline of human listeriosis cases should have occurred over the last 10 years. Research is thus needed to understand the reason behind this apparent discrepancy between the risk assessment data and the FSIS and CDC data on food contamination with *L. monocytogenes* and human listeriosis cases in order to facilitate further targeted interventions to reduce human listeriosis cases.