To: CanadaGAP Program Participants in Ontario

Date: November 16, 2016

Subject: Invitation to participate in fresh produce food safety research

Dr. Jeff Farber (Director, Canadian Research Institute for Food Safety at the University of Guelph) has reached out to the fresh produce industry regarding a potential research opportunity. This is in relation to the latest round of research funding that has been announced by the U.S. Center for Produce Safety.

Dr. Keith Warriner and Dr. Farber are looking for potential industry partners **in Ontario** who would be willing to work with them on the projects outlined below. They are currently looking for two or three company volunteers to work with them to do sampling in their operations, as per the draft project plans.

If your operation is in Ontario and you are interested, please contact Dr. Farber before November 25, 2016 at his coordinates below:

Dr. Jeff Farber, Professor, Dept. of Food Science
Director, Canadian Research Institute for Food Safety (CRIFS)
University of Guelph
Guelph, Ontario
Canada N1G 2W1
Tel.: 519 824-4120 Ext. 56101

Projects:

1. **Listeria monocytogenes (Lm) Prevalence and Persistence**:

Determine the prevalence and persistence of Listeria monocytogenes (Lm) in various environments and microenvironments

a) Produce on farm/orchard at the time of harvest - **QUESTION:** Do any of the plants grow their own products or source from products grown in Ontario?
2) Packinghouse and warehouse dry environments - Do any of them have warehouses/ packinghouses that we can sample for Lm
3) Produce coolers and distributions centers - same for produce coolers and DC's
4) Sample Produce micro-environs (e.g., HVAC units and motors that create elevated temperature microenvironments; condensation that creates a wet surface in otherwise dry operation)
5) Determine procedures, practices and factors that influence the rate of “resident” Lm establishment on produce farms, and in harvest operations, packing operations and fresh-cut produce processing plants.

With the isolates that we get, we would do whole genome sequencing (WGS), along with biofilm studies.

CanadaGAP® is a program developed in Canada to promote Good Agricultural Practices (GAPs) for fruit and vegetable suppliers.

2. Listeria monocytogenes (Lm) Basic Biology:

2.1. Lm Growth or No Growth in Foods: Determine which raw agricultural commodities and fresh-cut produce products will support the growth of Lm at recommended and abusive storage temperatures. This information is important to assess the potential for Lm proliferation, which is an important factor in assessing public health risk from a contaminated food product, and helps inform the entire produce supply chain regarding safe handling best practices.

We would do basic growth studies and modelling of growth in the products produced by the companies

3. **Listeria monocytogenes (Lm) Risk Assessment:**

3.1. Risk-Based Corrective Actions: Currently, commonly used *Listeria* spp. and Lm environmental monitoring program test techniques are qualitative or semi-quantitative. Development of quantitative *Listeria* spp. and/or Lm environmental monitoring technologies would be helpful in assisting operators to prioritize and determine the magnitude of corrective actions when Lm or Listeria spp.–positive test results occur.

A number of different quantitative tests for Listeria spp. and/or Lm will be evaluated, including a new LAMP assay. (With UBC)

3.2. Equipment Risk Assessment and Sanitation Frequency: If equipment is of less-than-optimal sanitary design and cannot easily be refurbished or retrofitted, effective cleaning methods and frequencies should be determined to minimize risk. This would include an evaluation and prioritization of different pieces of equipment based on persistence data and the rate at which Lm can establish residence in/on the different pieces of equipment. Cleaning frequencies and methods could be established that reduce the likelihood of Lm establishing residence.

We would also be sampling all equipment in the plants at various times of production and in different seasons, and when different products are being produced. WGS would be done.

3.3. Rate of Transference in Produce Facilities: Conventional thinking is that finding a Listeria positive sample in Zone 4 is of lower risk than finding one in Zone 3, and that Zone 3 is lower risk than Zone 2, etc. Understanding how Listeria travels through a facility can aid in the development of optimal facility design and environmental testing strategies.

3.4. Probability for Transference: Define system-wide and system-specific probabilities of Lm for transference from non-food–contact surfaces and areas (Zone 2 to 4) to food-contact surfaces and products.

We would sample for Lm/L spp. in all 4 zones, and at different times and seasons. WGS would be done. We would also work with modellers at York University and PHAC to develop models for transference in produce facilities.

For more information please contact:

Dr. Jeff Farber, Professor, Dept. of Food Science
Director, Canadian Research Institute for Food Safety (CRIFS)
University of Guelph
Guelph, Ontario
Canada N1G 2W1
Tel.: 519 824-4120 Ext. 56101