

Environmental Monitoring Program

Swabbing to Verify Sanitation Effectiveness

Foods of Plant Origin Program

AUGUST 2010

Infosheet

INTRODUCTION

As a food plant operator, you know that a sanitary environment is essential for the production of safe, high quality food products. There may be areas, however, that you would like clarified to improve food safety in your operation. For example:

- How to make sure your cleaning and sanitizing programs are effective
- What to do to verify that all food soils have been removed and that invisible microorganisms that could cause spoilage or illness have been eliminated, and
- The difference between “visually clean” and “microbiologically clean”

Risk Management Specialists in the Foods of Plant Origin Program at the Ontario Ministry of Agriculture, Food and Rural Affairs’ (OMAFRA) are available to answer your questions and help you initiate a process to verify the effectiveness of your cleaning programs.

VERIFYING CLEANING PROGRAM EFFECTIVENESS

Effectiveness is best verified using:

- ATP bioluminescent monitoring after cleaning to detect remaining food debris; followed by,
- Microbial monitoring after sanitizer application to confirm that no viable bacteria remain.

Both techniques are provided to foods of plant origin facilities as part of OMAFRA’s Environmental Monitoring Program. In facilities that choose to be part of the program, only surfaces within the facility are swabbed for testing. Product testing is not part of the program.

In addition to food contact surfaces, areas that are difficult to clean or likely to harbour microorganisms are selected as swabbing sites.

ATP Bioluminescence

ATP bioluminescence is a quick test for determining the relative cleanliness of a surface. ATP (adenosine-5'-triphosphate) is a substance found in all living cells, including food, bacteria, yeast and mould cells. This test uses a device called a luminometer to measure the combined total of organic material (food residues and microbial populations) collected from a swabbed surface.



ATP Bioluminescence is a quick, easy way to determine the relative cleanliness of a food plant surface. There are a number of manufacturers of quality luminometers. A Hygiena model is pictured above.

High values are indicative of high levels of surface organic matter resulting from poor sanitation practices.

ATP bioluminescence results are obtained within seconds. If the reading indicates that a surface is not clean, re-cleaning procedures can be initiated immediately to correct the unsanitary condition.

The technology used in ATP bioluminescence requires little training and minimal preparation time. Both the luminometer and the swabs are relatively inexpensive.

Microbial Monitoring

Microbial monitoring complements ATP bioluminescence. While a clean surface generally is an indicator of low microbial levels, it is not a guarantee that the area is microbiologically clean. To determine microbial types and/or populations, microbiological analysis of surface areas must be undertaken.

Aerobic Plate Count

A variety of microbial testing formats and sampling techniques exist. The capabilities and limitations of each must be carefully considered to ensure the most appropriate is chosen.

For processing conditions generally encountered in foods of plant origin facilities, the Aerobic Plate Count (APC) is the most suitable indicator of levels of viable microorganisms remaining on a surface after cleaning and sanitation.

High APC counts indicate poor sanitation, however this technique does not identify specific bacteria nor does it identify those that can cause illness in humans. Therefore, a low APC value does not guarantee the absence of pathogens. That's why OMAFRA's microbial testing program also includes *Listeria* testing.



Microbial concentration is determined by counting colonies on a Petri plate.

Listeria spp.

Listeria monocytogenes, which can cause listeriosis in humans, is sometimes found on surfaces in the processing environments of ready-to-eat foods such as

minimally processed fruits and vegetables, apple cider and sprouted seeds.

Testing for all *Listeria* species, rather than just *L. monocytogenes* increases the detection ability for *Listeria*. Treating all positive results as though they were *L. monocytogenes* also increases the plant's ability to take corrective measures.

As part of OMAFRA's foods of plant origin microbial testing programs, sponge swabs are rubbed on a production surface area, sealed in a sterile bag and sent to an accredited laboratory for analysis.

WHEN UNSANITARY CONDITIONS ARE FOUND...

Where unsanitary conditions are identified as a result of ATP bioluminescence or microbial testing, the risk management specialist conducting the swabbing will suggest corrective actions specific to the operation.

For more information regarding participation in OMAFRA's Foods of Plant Origin Environmental Monitoring Program please contact:

For more information:

John Henderson

Risk Management Specialist

Telephone: 1-613-475-5175

E-mail: john.henderson@ontario.ca

Bengt Schumacher

Risk Management Specialist

Telephone: 1-705-725-7295

E-mail: bengt.schumacher@ontario.ca

Peter vanWeerden

Risk Management Specialist

Telephone: 1-905-562-1671

E-mail: peter.vanweerden@ontario.ca

Paul Bailey

Risk Identification and Management Coordinator

Telephone: 1-519-826-4380

E-mail: paul.bailey1@ontario.ca

Dr. Robert Blenkinsop

Food Scientist - Horticulture

Telephone: 1-519-826-4535

E-mail: robert.blenkinsop@ontario.ca

www.ontario.ca/omafra