

**Experiences with Controlling
Listeria monocytogenes in Ready-
to-Eat Food Processes**

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L. monocytogenes as a Public Health Risk

- Certain human subpopulations are significantly more susceptible to listeriosis
- Foods commonly implicated in foodborne listeriosis contain >1000 CFU/g (ICMSF)
- Certain RTE foods support the growth of *L. monocytogenes* (*Lm*) and are higher risk

L. monocytogenes as a Public Health Risk

- The risk of listeriosis can be managed through effective control programs

The Problem with “Zero Tolerance”

Regulatory tolerances should:

- not be unnecessarily restrictive or unrealistic to achieve
- be risk-based
- promote public health protection and improvements

Consumer protection can be better assured through the application of Food Safety Objectives (FSO)

Food Safety Objective

- Maximum frequency and/or concentration of a microbiological hazard in a food at the time of consumption that provides the appropriate level of protection (ICMSF)

Food Safety Objective

- No more than 100 *Lm* CFU/g or mL in RTE foods at the time of consumption (ICMSF)

Experiences with Environmental Sampling

- Effective sampling programs will occasionally detect the organism
- Such programs are not “statistically based” or randomly applied
- Rely on experience and familiarity with process to determine sampling sites and numbers

Experiences with Environmental Sampling

- In an operation that maintains sanitary control, *Listeria* contamination is most likely line specific

Plant management and regulatory agencies should encourage detection of the *Listeria* in the environment. Such findings must be considered a success!!

The Dilemma

- In order to resolve most contamination issues with *Listeria*, equipment must be operated to ultimately determine the source
- During the investigation, a number of environmental positives may result
- Through ongoing trend analysis and corrective action, the contamination source can be discovered and addressed

Meat Patty Plant

	8/4	8/11	8/18	8/25	9/1	9/8	9/15
Line 1	0	0	0	0	0	0	0
Line 2	0	0	0	0	0	1	1
Line 3	0	0	1	0	1	0	1
Line 4	0	0	0	1	0	0	0
Floor 1	0	0	0	1	0	0	0

0 = negative; **1** = positive

Future Directions

- Industry expands sharing of best practices
- Improved control of *Listeria* on floors
- Improvements in equipment design
- Equipment is approved *before* purchase
- Tighter control of equipment maintenance
- Equipment thermal treatments are implemented as scheduled, routine procedures

Product Sampling

The Problem with Routine Microbiological Testing of Product Samples

- Unreliable means to assess food safety
- Only provides a “snapshot” and does not indicate whether a food operation can consistently produce safe foods

Microbiological Testing in Validated Food Operations

Microbiological testing is useful for:

- validating the effectiveness of a control system**
- assessing control of the environment**
- determining disposition of food following a deviation**
- assessing an operation when an audit or inspection questions the control system**

Shortcoming of Routine Product Sampling: An Example

At a contamination level of 0.5%, there is a 61% probability that a production lot would be accepted even if 100 samples were tested (ICMSF).

The Value Environmental Testing Gives Beyond Product Testing

- Information exists about a potential source of contamination
- Environmental data and trend analysis can then be used to resolve the problem
- Product testing does not offer this opportunity

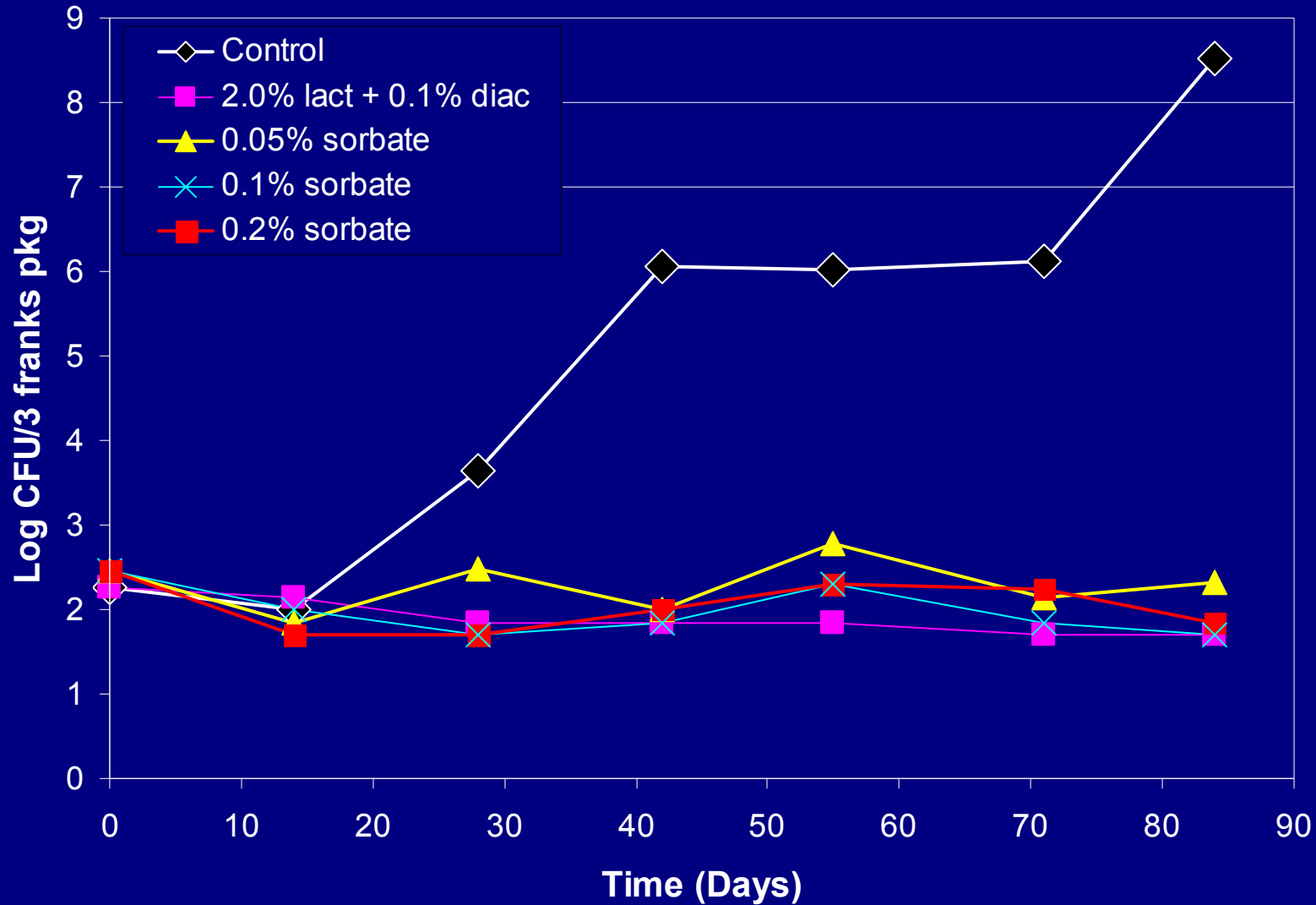
Product Types and Consumer Risk

- Any microbiological sampling initiatives should focus on enhancing public health
- Foods which do not support the growth of *Listeria* should receive much less attention than those which do

Minimal Risk Products

- Frozen foods held at ≤ -1 C
- Foods having a pH <4.4
- Foods having a water activity of <0.92
- Foods demonstrated not to support Lm growth due to other interactive or synergistic effects

Listeria monocytogenes Growth on Beef Frankfurters Stored at 4 C



Product Sampling Plans

- Should be be scientifically valid and based on product risk (e.g., ICMSF)

The Canadian Risk-Based Approach

- Distinguish sampling and testing criteria based on product risk
 - <1 CFU/25 g for higher risk foods
 - <100 CFU/g for lower risk foods

Best Avenues to Public Health Protection

- Promote aggressive environmental sampling plans designed to detect *Listeria*
- Quickly respond to positive sites
- Focus regulatory resources on plants not having environmental sampling programs
- Concentrate efforts on higher risk products
- Continue to apply and seek bacteriostatic and bacteriocidal treatment alternatives