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MERIEUX NutriSciences

Validation of Detection of *Listeria monocytogenes* in 125 g Test Portions in One Natural Cheese Product

Authors: Wendy McMahon[1], Helen Andrews[2], Jacqui Zimmerman[3], Cheng Zhang[1] and Upasana Hariram[1],
[(1)]Mérieux NutriSciences, Crete, IL, [(2)]Mérieux NutriSciences, Cypress, CA, [(3)]Mérieux NutriSciences, Chicago, IL

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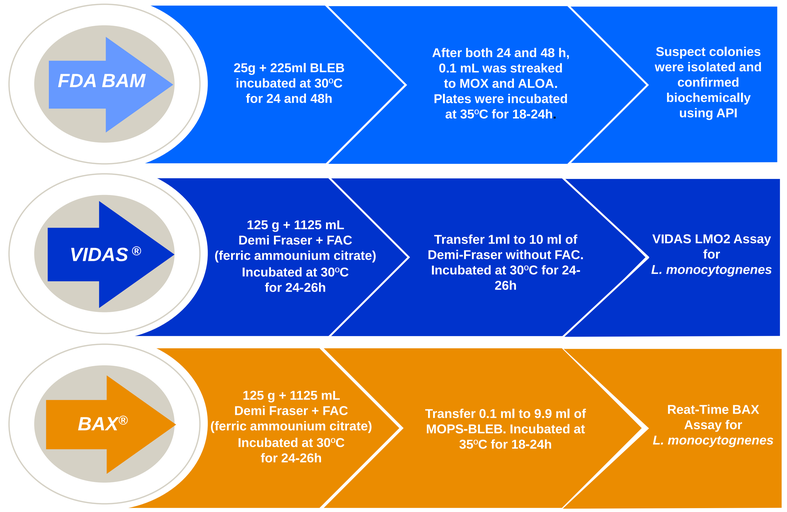
ABSTRACT

Microbiological methods are generally validated for detection of 1 cell of *Listeria monocytogenes* in 25 g test portions for specific food matrices. To maximize time and money, many laboratories pool multiple 25 g test portions into one 125 g sample. The objective of this study was to compare the detection of *L. monocytogenes* in 125g test portion of Swiss cheese by two candidate methods, VIDAS® LMO2 and BAX® System Real-Time PCR, to 25g test portions by FDA BAM reference method. Individual portions of 25g and 125g of Swiss cheese were prepared and inoculated targeting low and high inoculations levels with one strain of *L. monocytogenes* according to FDA's *Guidelines for the Validation of Analytical Methods for the Detection of Microbial Pathogens in Foods and Feeds*. Inoculation levels were 1.8 and 8.6 colony forming units per gram (CFU/g) for low and high target, respectively. Replicate samples (20 low and 5 high target inoculated samples) for each method were analyzed. Results were statistically analyzed using probability of detection (POD) for unpaired samples. The presumptive and confirmed results were identical for all samples. Both candidate methods performed as well or better (significant difference at the 0.05 probability level) when detecting *L. monocytogenes* in 125g of Swiss cheese when compared to the FDA BAM method (25 g) Based on the study results, VIDAS® LMO2 and BAX® System Real-time PCR for *L.monocytogenes* are acceptable methods for use in detecting *L. monocytogenes* in pooled 125g Swiss cheese.

Can *Listeria monocytogenes* be detected in 125g test portion of Swiss cheese?



All enrichments were streaked to MOX and ALOA for cultural confirmation. Plates were incubated at 35ºC for 18-24 h. Up to 5 typical colonies were selected from the ALOA plate or MOX plate and streaked on TSA-YE for biochemical confirmation using API.

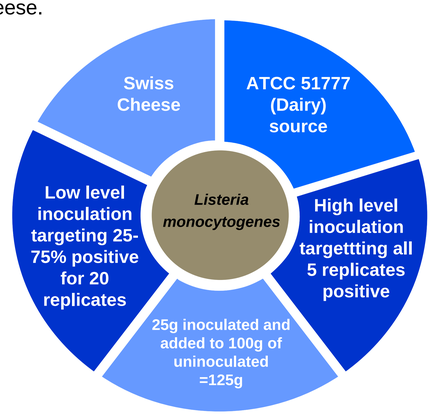
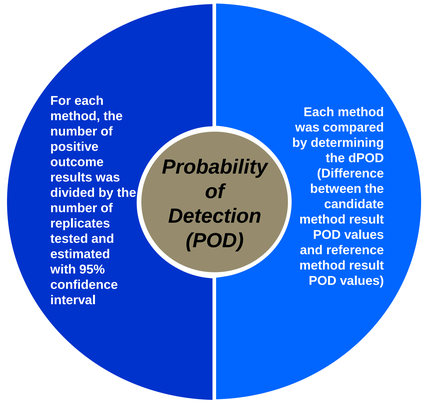


Table 1. Summary of results of detection of *Listeria monocytogenes* in Natural Cheese at 125 g

		BAX® 125 g (# Positive/#Samples)		VIDAS® LMO2 125 g (# Positive/#Samples)		FDA BAM 25 g (# Positive/#Samples)	
Contamination Level	Level CFU/Test Portion	Presumptive	Confirmed	Presumptive	Confirmed	Presumptive	Confirmed
Control	Not Tested	0/5	0/5	0/5	0/5	0/5	0/5
Low	1.8	10/20	10/20	8/20	8/20	8/20	4/20
High	8.6	4/5	4/5	3/5	3/5	3/5	3/5

The aerobic plate count level was 10^{5-6} CFU/g, coliform level was <10 CFU/g and lactic acid bacteria level was 10^{6} CFU/g. The presumptive and confirmed results were identical for all Real-time BAX® and VIDAS® LMO2 samples. The BAX® System Real-time method outperformed the reference method (FDA BAM) at a statistically significant level with the CI = 0.01, 0.53. There were no statistical significant differences in the detection of *L. monocytogenes* between the VIDAS® LMO2 125g and the FDA BAM methods.

Based on the study results, the Real-time BAX® LM PCR and VIDAS® LMO2 methods are acceptable methods for use in detecting *L. monocytogenes* in 125 g Swiss cheese



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