

Validation of PCRFast Salmonella spp. and PCRFast Listeria monocytogenes in routine food analysis at three independent facilities

Wolfgang Hauser ¹, Joseph Kleer ², Josephine Reiss ¹, Martin Schollmeyer ³, Anja Schuhr ¹, Wolfgang Weber ¹

¹ Institut für Produktqualität, Teltowkanalstrasse 2, 12247 Berlin/ Germany ² Institut für Lebensmittelhygiene der Freien Universität Berlin, Königsweg 69, 14163 Berlin/ Germany ³ Th. Geyer Berlin GmbH, Dillenburg Strasse 53, 14199 Berlin/ Germany

Introduction

Salmonella and Listeria are globally recognized as major pathogens in food and feed. Their impact on animal and human health is undoubted and broad screening activity is demanded by legislation and consumers. Classical microbiology has developed the detection of these two pathogen groups to a high standard.

But increasingly time is also a crucial factor for customers of public and private labs: goods have to be released in time in order to catch up with modern logistic systems.

Thus, the criteria for a new test of Salmonella and Listeria is not only to maintain the high quality standards achieved by classical methods and fulfill the food laws, but also to exceed the established tests by speed.

Method

251 samples from routine food screening were independently analyzed in two ways: Classical microbiology was done by Freie Universität Berlin and a private lab. PCRFast analysis including enrichment culture was done in the Institut für Produktqualität. All samples were integrated into daily routine testing.

All Salmonella tests were performed according to DIN EN ISO 3679 for classical microbiology needing 66 hours and DIN EN ISO 22174 for PCR needing 28 hours from start to result.

Classical Listeria monocytogenes testing was carried out as indicated by FDA instructions (Hitchins et al. Bacteriological Analytical Manual, FDA/Center for Food Safety & Applied Nutrition) taking 76 hours. PCR for Listeria monocytogenes took 52 hours.

Results

Sample type	Number of samples	PCRFast Salmonella spp.		University (Classical microbiology)		Private lab (Classical microbiology)	
		+	-	+	-	+	-
Meat/ Sausage	20		20		15		5
Fish	5		5		5		
Vegetables	10		10		10		
Ice	17		17		17		
Chocolate	20	2	18			2	18
Wheat products	18	6	12	6	12		
Convenience Pizza	35	7	28	7	28		
Convenience Food	14		14		14		
Mixed samples	9		9		9		
Noodle meals	13		13		13		
Potato meals	6		6		6		
Sum	167	15	152	13	129	2	23

Sample type	Number of samples	PCRFast Listeria monocytogenes		University (Classical microbiology)	
		+	-	+	-
Vegetables	2		2		2
Convenience Pizza	81	8	73	8	73
Cheese	1		1		1
Sum	84	8	76	8	76

All 167 results made with PCRFast Salmonella spp. were confirmed by classical microbiology in two independent labs. PCRFast Listeria monocytogenes also yielded all 84 results being totally compatible to classical microbiology.

Discussion

100% identity with classical microbiology show PCRFast Salmonella spp. and PCRFast Listeria monocytogenes being a trustworthy alternative to classical microbiological methods. The benefit of speed from start to result are 38 hours for PCRFast Salmonella and 24 hours for PCRFast Listeria monocytogenes. In both cases total sample numbers exceeded the 60 samples described for a Validation in DIN EN XXXXX by far.

Combining the above mentioned time advantage with simple handling and long shelf life, PCRFast is an attractive option for labs analyzing Salmonella and Listeria samples.

