

# The Pulsifier® and Path-chek® : New techniques to improve the detection of pathogens in food handling environments.

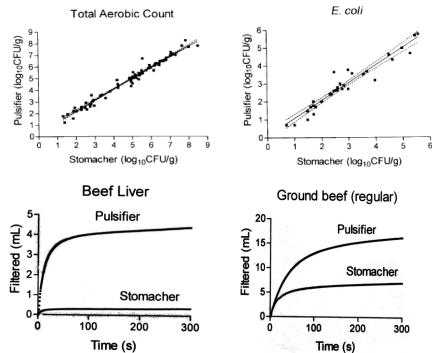
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Pulsifier® uses a novel proprietary principle to prepare microbial suspensions from food. A metal ring beats the outside of the bag at high frequency. This action produces a combination of shock waves and intense mixing which rapidly releases the microbes into suspension

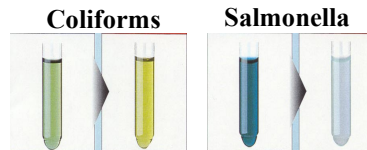
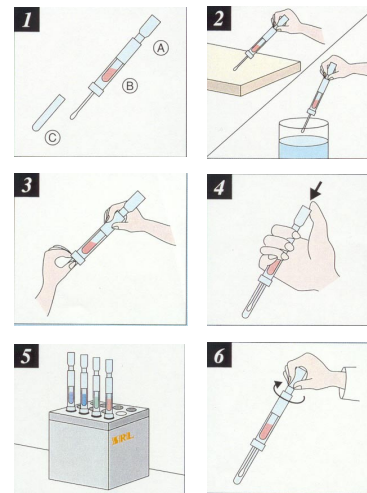
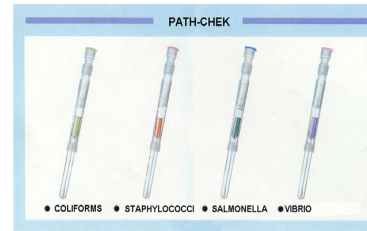


Pulsified mushrooms

Stomached mushrooms

## Comparative isolation of pathogens

Sample	Organism	Method	Log <sub>10</sub> cfu/gm	Log <sub>10</sub> cfu/gm
Peas	S. enteritidis NCTC 4444 10 <sup>3</sup> /gm	Pulsifier	4.06 (0h)	8.76 (18h)
		Stomacher	4.10 (0h)	7.13 (18h)
Minced Beef	S. enteritidis NCTC 4444 10 <sup>3</sup> /gm	Pulsifier	4.06 (0h)	9.65 (18h)
		Stomacher	4.06 (0h)	9.69 (18h)
Peas	L. monocytogenes NCTC 5214 10 <sup>3</sup> /gm	Pulsifier	4.59 (1h)	
		Stomacher	4.59 (1h)	
Minced Beef	L. monocytogenes NCTC 5214 10 <sup>3</sup> /gm	Pulsifier	4.75 (1h)	
		Stomacher	4.67 (1h)	
Peas	E. coli 0157 10 <sup>3</sup> /gm	Pulsifier	6.49 (6h)	
		Stomacher	5.88 (6h)	
Minced Beef	E. coli 0157 10 <sup>3</sup> /gm	Pulsifier	6.62 (6h)	
		Stomacher	6.28 (6h)	



## Minimum Detection levels of Coliforms

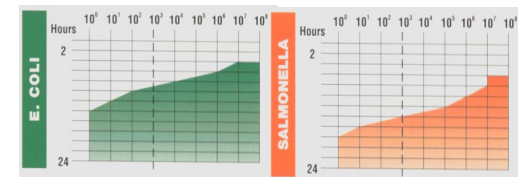
Test Condition	Organism	Detection Level
Direct Swab Inoculation	E. coli ATCC 25922	<1 cfu/μl
	E. coli (environmental)	<1 cfu/μl
	Enterobacter cloacae	<1 cfu/μl
Wet Surface	E. coli ATCC 25922	<1 cfu/cm <sup>2</sup>
	E. coli (environmental)	<1 cfu/cm <sup>2</sup>
	Enterobacter cloacae	<1 cfu/cm <sup>2</sup>
Dry Surface	E. coli ATCC 25922	<130 cfu/cm <sup>2</sup>
	E. coli (environmental)	13 cfu/cm <sup>2</sup>
	Enterobacter cloacae	13 cfu/cm <sup>2</sup>

## Minimum Detection levels of Salmonella

Organism	Swab Inoculation	Wet Surface
S. enteritidis	10 cfu/μl	<1 cfu/cm <sup>2</sup>
S. typhimurium	<1 cfu/μl	<1 cfu/cm <sup>2</sup>
Salmonella (66) Environmental isolate	<1 cfu/μl	<1 cfu/cm <sup>2</sup>
Salmonella (121) Environmental isolate	<1 cfu/μl	<1 cfu/cm <sup>2</sup>

Note : Recovery from dry surfaces was poor, however, Microgen supply a wetting agent for use on dry surfaces

## Chromogen formation rate relative to pathogen numbers



## CONCLUSIONS

- Pulsifier produces cleaner samples for rapid food microbiology
- Path-chek offers a simple, contained rapid method for pathogen contamination on food handling surfaces
- These methods enhance pathogen monitoring of food handling environments

## Cryptosporidium recovery following Pulsification

SAMPLE (source)	SPIKE	METHOD	RECOVERY
Waterress (Moredu)	10 <sup>5</sup> -10 <sup>7</sup>	0.45 μm filter	~10%
Dirty Water (Moredu)	10 <sup>4</sup>	Direct stain	97%
Lettuce (Moredu)	10 <sup>6</sup> , 10 <sup>7</sup>	0.45 μm filter	10%
Lettuce (Rome)	10 <sup>8</sup>	0.45 μm filter	80%
Dirty Water (Rome)	10 <sup>8</sup>	Direct stain	30%

Release procedures were performed utilising 2g of sample material in 20 ml of release medium (PBS), pulsified for 1 minute. Following pulsifying, samples were concentrated by the methods given in the table, or enumerated without concentration.

## Recovery of Cryptosporidium oocysts from Carcass Meat

Treatment Type	No. of Replicates	Mean oocyst recovery (%)
Pulsifier®	7	26,777 (56%)
Stomacher®	7	21,926 (46%)

Mean oocyst recoveries from meat pieces following filtration of a pulsified (n = 7) or stomached (n = 7) meat suspension through a cellulose nitrate membrane (47 mm diameter, 0.45 μm pore size)

## TRADEMARKS

Pulsifier® and Path-chek® are registered are trademarks of Microgen Bioproducts Ltd

Stomacher® is a registered trademark of Seward Medical, London UK

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