Implementation of Copan FecalSwab™ and Copan Selenite™ on WASP® for the automated processing of stool specimens

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asm microbe 2017 JUNE 1–5 • NEW ORLEANS

SUNDAY June 4, 2017
Poster # 421

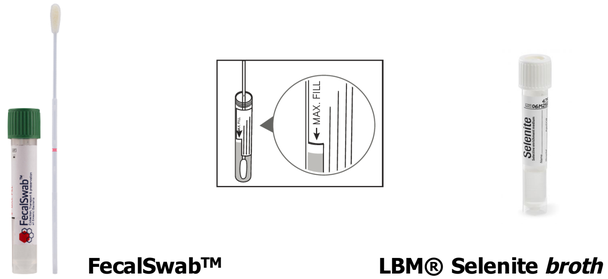
Background

Automated processing of stool specimens is difficult due to different sample consistency, volume availability and variety of primary containers. Appropriate specimen collection and transportation systems can standardize the stool sample processing, enhancing the diagnostic process. Copan FecalSwab™ (FS), a tube with 2ml Cary-Blair medium and a flocked swab, can be used for culturing most relevant enteric pathogens from both rectal swabs and stool samples. Copan Selenite broth, available in a 2 ml tube, can be used for selective enrichment of *Salmonella spp.*

Objective

The objective of this study was to validate the implementation process of FecalSwab™ and LBM® Selenite broth on WASP® for the clinical microbiology laboratory in order to convert stool processing from the manual streaking process to an automated procedure.

Materials



FecalSwab™ **LBM® Selenite *broth***

Methods

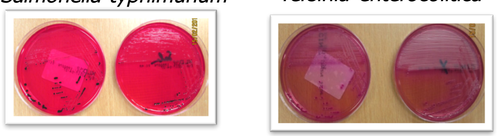
Spiked negative stools and clinical stools were used for this study (n=97). Aliquots (3 grams) of the negative stools were spiked with 300 µl of diluted *Y. enterocolitica serovar 3 biotype 4*, *S. typhimurium* (ATCC *25241*), *S. flexneri* (clinical strain) and *Campylobacter jejuni (ATCC 33560)* to obtain final bacterial concentrations/stool of 10^8 CFU/g, 10^7 CFU/g, 10^6 CFU/g. All clinical stool samples (n=61) and spiked stools in triplicate (n=36) were transferred in FecalSwab™ medium tubes using the flocked swab.

Methods cont.

All samples were manually plated onto the first quadrant of McConkey, XLD, CIN, Campylosel agar plates using a swab and streaked with a 10 µl loop, while the FecalSwab™ stools were loaded on WASP® and processed using a 10 µL loop and a 4 quadrants streaking pattern. All clinical stool samples and the negative ones spiked with *S. typhimurium* (n=73), were also inoculated in LBM® Selenite broth broth, from FecalSwab™ and from the sample directly, and then plated on SS-agar after overnight incubation.

Campylobacter jejuni *Shigella flexneri*

Salmonella typhimurium *Yersinia enterocolitica*



WASP® Manually WASP® Manually

Results

For the spiked samples we found 100% concordance for *S. flexneri* and *C. jejuni*. Discrepant results were found in the stools spiked with the lowest concentration of *S. typhimurium* and *Y. enterocolitica*, negative when manually plated but positive from FecalSwab™ and LBM® Selenite broth.

We found 100% concordance in the clinical samples with *S. typhimurium* and *Y. enterocolitica*, three *Campylobacter coli* were not isolated, maybe due to sampling bias.

Culture via FecalSwab™ yielded two extra *Aeromonas species* possibly because WASP® streaked FecalSwab™ samples had more isolated colonies to perform successive analysis.

LBM® Selenite broth detected all the *Salmonella spp.* and some additional *Yersinia spp.* with both WASP® and manual streaking method.

Isolates	Spiked Samples (n=36)	
	Manual streaking (Swab)	WASP® Streaking (10 µl)
Salmonella (n=9)	6	6
Shigella (n=9)	9	9
Campylobacter (n=9)	9	9
Yersinia (n=9)	3	4
Negative (n=10)	10	10

Isolates	Clinical Samples (n=63)	
	Manual streaking (Swab)	WASP® Streaking (10 µl)
Salmonella (n=9)	8	8
Shigella (n=0)	0	0
Campylobacter (n=26)	26	23
Yersinia (n=6)	6	6
Aeromonas (n=2)	0	2
Negative (n=20)	20	20

Isolates	after LBM® Selenite Enrichment (n=14)	
	Manual streaking (Swab)	WASP® Streaking (10 µl)
Salmonella	14	14
Yersinia	2	1

Conclusions

FecalSwab™ and LBM® Selenite broth are facilitating WASP® automation stool processing and are reliable devices for diagnosis of gastric infections.

Automatic processing of FecalSwab™ and LBM® Selenite broth allows standardization and time reduction of sample processing.