Copan FecalSwab™ and WASP™ Automation Improved the Detection of Gastrointestinal Bacteria in our Microbiology Laboratory

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Background:

We already had WASP™ automation in our Microbiology laboratory for processing clinical specimens for Gram smear preparation and agar plating for bacteria cultures. All stool samples were riceveid in containers with solid Cary Blair medium (Sanimed-Romania). We decided to validate the Copan FecalSwab™ (FS) kit, a flocked swabs and tube with 2 ml of Cary Blair medium for the preservation and transport of stool samples and compatible with WASP™ automation. FS gave us the opportunity to standarize stool sample preservation, since we receive specimens from different collection units, and to facilitate stools processing on the WASP™.

OBJECTIVES:

The objectives of this study were:

1) to compare the performace of the FecalSwab™ to the current container (CC) for the collection, storage and transportation of stools for the detection of gastrointestinal bacteria.

2) To implement FecalSwab stool processing on WASP™ automation.

METHODS:

For the FecalSwab initial validation, 100 stool samples were processed in duplicate, one collected in FecakSwab™ and other in CC.

Both specimens were inoculated on MacConkay, Hektoen Enteric, Yersinia, Campylobacter agar plates (OXOID, UK) and Selenite Broth, plated on Hekton Enteric Agar after 24 incubation.

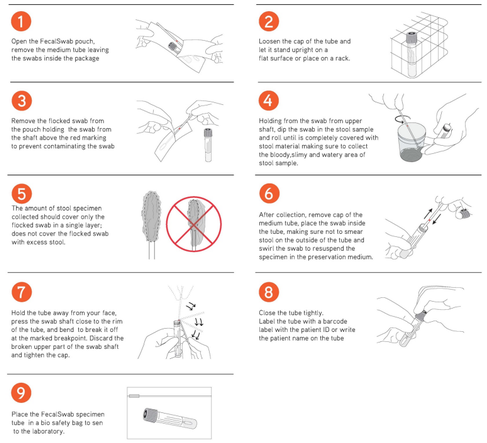
The FecalSwab™ samples were loaded on the WASP™ and seeded with 10 microliters loop and a 4Q type1" streaking pattern.

The CC samples were plated as per current manual method according to laboratory SOPs using 10 microliters loop.

Plates were incubated at 35^{0}C for 24-48h and 48-96h in microaerophilic conditions (GasPak, BD) at 42^{0}C for *Campylobacter*. WASP and manually culture results were recorded and compared.

It was noted that cultures, plated by the WASP™, were easier to read with more single colonies allowing us to identify an increase number of pathogens. Bacterial identifications were carried out by mass spectrometry (Maldi Biotyper, Bruker).
After the validation was completed, the FecalSwab™ was implemented for the collection and transportation of all the stool samples from all our collection centers and processed on the WASP as per the validated protocol. To date we processed over 10,000 stool samples.

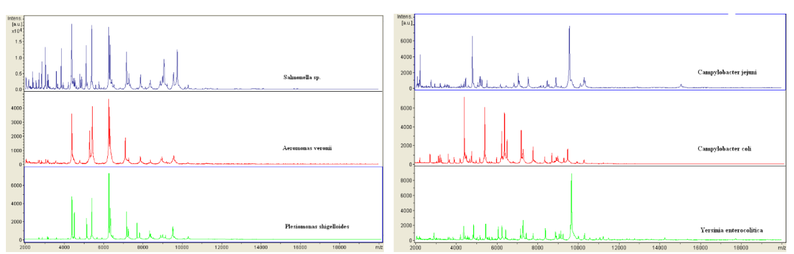
Copan FecalSwab™
Stool sample collection device procedure



Walk Away Specimens Processor (WASP™)

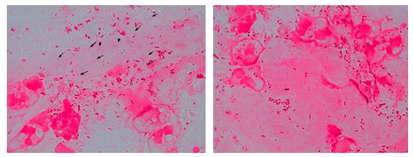
4Q type1 Streaking pattern using 10 µl Loop

Maldi Biotyper Spectrum

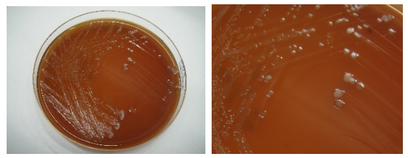


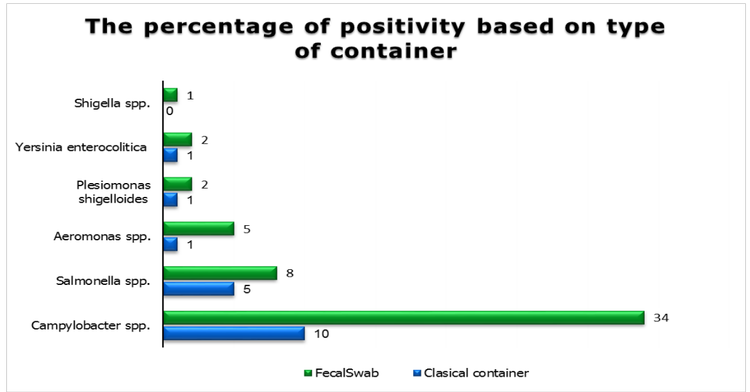
RESULTS:

Gram – stained microscopic examinations of faeces, 1000x



Campylobacter jejuni culture, after 72 h on Columbia agar with CAMP Selectatab





The data obtained indicated that using the FecalSwab™, we detected an increased positivity rate in stool specimens.
The increased % of positives obtained with automated method over manual method was 34% from 10% for *Campylobacter* species (26% *C. jejuni* and 8% *C. Coli/* 10% *C.jejuni*), 8% from 5% for *Salmonella* species, 5% from 1% for *Aeromonas* species (4% *A. caviae* and 1% *A. veronii/* 1% *A. caviae*), 2% from 1% for *Plesiomonas shigelloides*, 2% from 0% for *Yersinia enterocolitica* and 1% from 0% for *Shigella* species.
Many more *Campylobacter* positive samples detected by FecalSwab™.

CONCLUSIONS:

The Copan FecalSwab™ improved the detection of enteric pathogens compared to the current containes.

The data obtained demonstrated that the FecalSwab™ is a better device for transporting and storing gastrointestinal pathogens.

WASP™ automation improved the laboratory workflow and the results turn around time resulting in better patient care.

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