

## A3: Reduce processing time of faeces sample for routine culture (Salmonella species, Shigella species, Campylobacter species and E Coli 0157) by using EntericBio Molecular Platform

Key Trust Deliverables: Health & Safety ✓ High Quality Care ✓ Good Use of Resources ✓ Accessible & Responsive ✓

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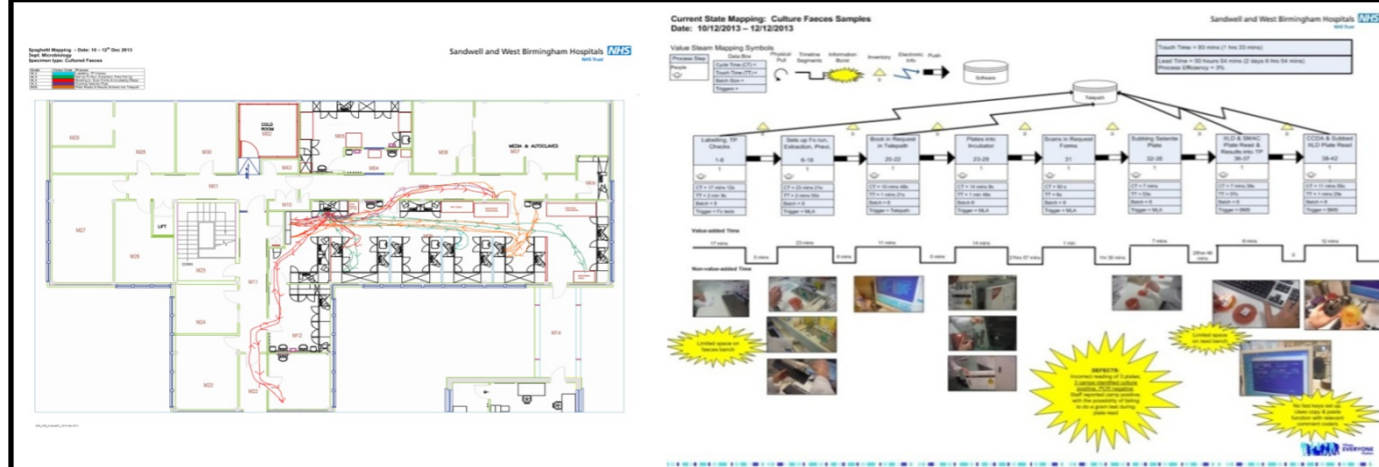
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### Define the problem (What problem are you trying to solve?)

• Lengthy processing times for routine faecal samples impacts on staff workload and skill mix, restricting productivity of the laboratory.

### Current State (What happens now? A simple, visual summary)



• It takes 4hr 53mins hands on time & 2days 6hrs 58mins lead time to process 8 faeces samples using routine culture for Salmonella, shigella, Campylobacter, E Coli 0127, Crypto, Giardia & C.diff. • Limited working space on faeces bench & reading bench. • Culture of the specimens takes on average 48 hours, with up to a further 24 hours for preliminary identification. • Reading of specimens uses BMS time unnecessarily & delays identification of organisms with potential public health implication.

### Goal (Specific, Measurable, Achievable, Realistic, Timely)

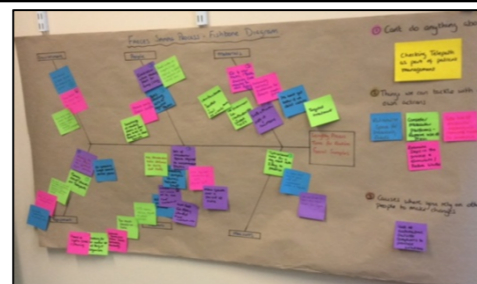
• Use of the EntericBio® molecular method for detection of the genes for Salmonella, Shigella, Campylobacter species, E Coli 0157, Crypto, Giardia & C.diff should reduce BMS (biomedical scientist) time taken for reading plates to perform other more important duties. Total staff time to process & read a batch of 8 negative samples using this new method is 3 hours; the opportunity is to move from a 2 to 3 days turn around time of a negative result using a culture method to a 1 day turn around time for negative result using molecular testing platform.

### Waste identified (Transportation, Inventory, Motion, Automation of inefficient process, Waiting, Overproduction, Overprocessing, Defects, Skills (unused))

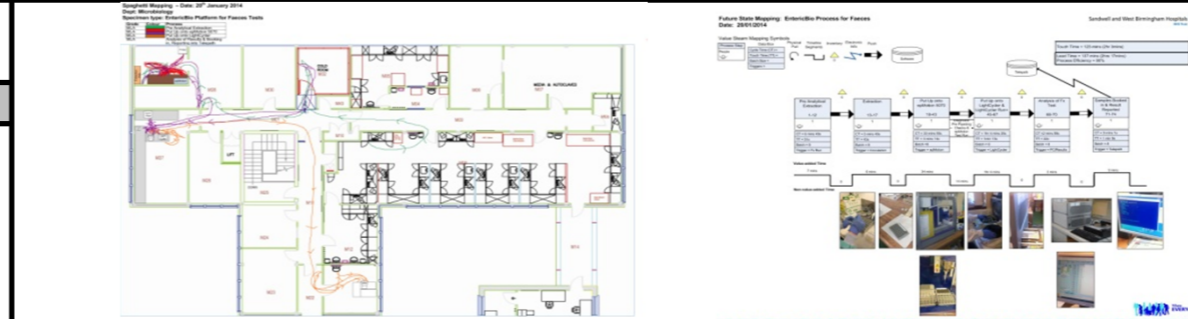
**Transport:** NA **Inventory:** Too many plates generated for negative specimens.  
**Motion:** Unnecessary wasted step in processing faeces samples using culture method for all samples  
**Waiting:** Two days incubation time to culture pathogens  
**Over Production/Over Processing:** NA  
**Defects:** Incorrect reading of plates; Staff reported 3/322 (0.9%) Campylobacter positive result & the possibility of failing to do a Gram test when reading the plates.  
**Skill Utilisation:** BMS time wasted reading negative plates

### Root Cause Analysis (What is the root cause of the problem?) Use fishbone/cause and effect diagram

• Large amount of space required for processing samples in various areas.  
 • Preparing test for faecal tests is part of the pre-analytic for getting samples labelled, checked, and selecting the correct investigations.  
 • Number of plates per specimen to provide a routine set of results can take up a lot of space within the laboratory. Current method can take 3 days TAT for negative result • BMS reading lots of negatives plates, sensitivity of reading these plates are poor due to volume of bacteria in stool sample, resulting in missed detection of Shigella and Campylobacter



### Future State / Countermeasures



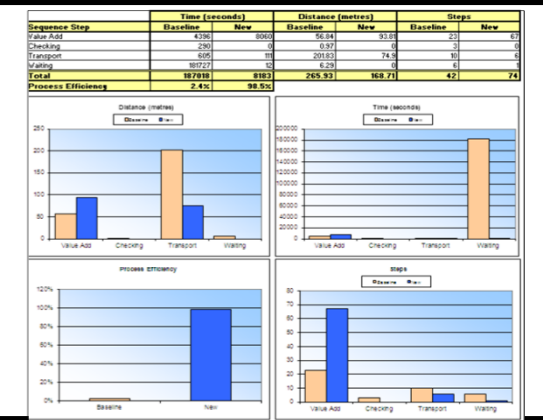
• It takes 2hrs 3mins to process 8 faeces samples using EntericBio Molecular Platform. The total lead time equates to 2hrs 17mins. • All grades can set up epMotion5070 & LightCycler analysers. • Results are easy to analyse, error proofing from incorrectly reading plates and reporting. • Automatically release negative results to users. • All reports will carry interpretative advice. • Close liaison with Public Health England to ensure potential outbreaks can be averted via earlier diagnosis.

### Action plan

Action - What, Why, How	Who?	When?	Progress Status
Order EntericBio Kits from Suppliers (SLA) via iProc	PP	Apr-14	Completed
Engage with GP/GASTRO/ACUTE Med	DrNR	Apr-14	Completed
Review Salmonella with HPA	GT	Apr-14	Completed
Produce Standard Operating Procedure	NR,PP	Apr-14	Completed
Produce A3 Bench Guide	NR,KD,MH	May-14	Completed
Scope out Training Programme	NR,ET,PP,MH	Apr-14	Completed
Sign off Change Control & Validation Plan	NR,DrNR,PP	May-14	Completed
Deliver Training & Competency Assessments	NR,BMSs,MH	Sep-14	In progress
Promote New way of testing Fx using molecular method	NR,ML,GT,KD,DrNR	Jul-14	Completed

### Results and Measures (What was your PDSA cycle, how long did you run it for, what data did you collect before and after the change, what did you find? Be visual!)

• Process Efficiency is 87% more efficient using EntericBio NB: Incubation has been based on when the Selenite Broth & CCDA plates were placed in the incubator  
 • 61 mins more value added time using EntericBio Molecular PCR  
 • Overall process time removed from introducing EntericBio is 49hrs & 40mins for negative results.  
 • 97 metres travelled less in processing faeces samples.  
 \*Theoretical annual cost savings of £4,761  
 Overall staff morale improved by 22%  
 \*Theoretical savings include those for incorporate Crypto, Giardia & C.diff



### Next Steps (Any remaining issues / problems - any further follow up required?)

• Introduce EntericBio method for detecting Cryptosporidium and Giardia spp.  
 • Consider option of using EntericBio method for detection of Clostridium difficile toxin  
 • To consider options for a safer PCR work flow