

From Farm-to-Fork : EMD Millipore Singlepath® Direct Campy Poultry Rapid Test Kit for Farm-Based Direct Detection of *Campylobacter* spp. in Faecal and Caecal Samples From Live Chicken

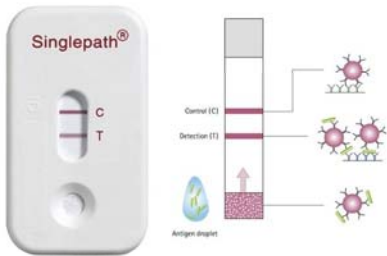
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Introduction

The 2012 EFSA Scientific Opinion on meat inspection (EFSA Journal 2012;10(6):2741) proposed testing the *Campylobacter* status of live broiler flocks ≤ 3 days prior to slaughter, to identify the 'high shedding' flocks and allow segregation from low-shedding at slaughter, thereby avoiding cross-contamination of carcasses and reducing human consumption of *Campylobacter* spp. Such a strategy requires on-farm testing and a method which requires no specialized equipment or laboratory-trained personnel. Lateral Flow technology fulfils this requirement and was used to develop the EMD Millipore Singlepath® Direct Campy Poultry Kit which offers a reliable, fast, user-friendly, alternative detection method to the laboratory-based cultural reference methods.

Lateral Flow Test Principle



The test is an immunochromatographic rapid test based on lateral flow technology. It detects *Campylobacter* spp. using monoclonal gold-labelled antibodies. If antigen is present it forms a complex with the gold-labelled *Campylobacter*-specific antibody and migrates to the binding test zone. There the complex binds to a second *Campylobacter*-specific antibody. The gold-labelling enables visualisation of the reaction by forming a distinct red line in the binding zone. The remainder of the sample continues to migrate to the control zone and binds to a third antibody-specific antibody. The formed red line in the control zone demonstrates that the test is functioning correctly.

Method

A direct (non-enrichment) sample preparation protocol was developed to enable a time-to-result of within 1 hour of sampling. Field studies were conducted both on-farm (faecal/caecal droppings) and at slaughterhouse (caecal contents) using a cross-seasonal representative set of broiler chicken faecal/caecal samples. Reference method comparison was ISO 10272 method and quantitative real-time PCR.

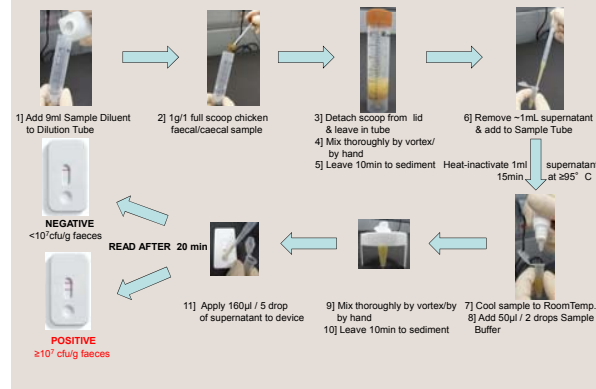
Study 1: On-Farm Field Trial (Faecal Droppings), Austria (Sampling period: 24.07.-30.09.2012; n=180 samples)

12 broiler flocks aged 3-5 weeks pre-slaughter; 3 sampling events per flock; pooled faecal samples (100 samples homogenised per flock; 5 samples tested); Reference method: Culture (ISO 10272, no quantitation) and RT-PCR (quantitation).

Study 2: On-Farm (Caecal Droppings) (n=24 samples) and Slaughterhouse Field Trial (Caecal Contents) (n=63 samples), Belgium (Sampling period: 08.2012-02.2013;)

Farm level: 13 farms, 25 flocks aged 6 weeks pre-slaughter; pooled caecal samples; Reference method: Culture (quantitation). Slaughterhouse level: 18 batches; per batch 3 caeca contents were individually examined. Additionally, pooled samples (10 caeca contents) from 10 batches were examined. Reference method: Culture (quantitation).

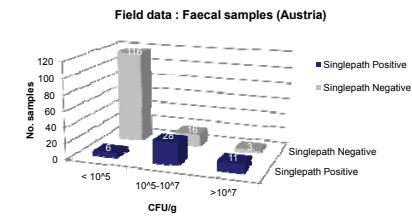
Singlepath® Direct Campy Poultry Test Protocol



Results

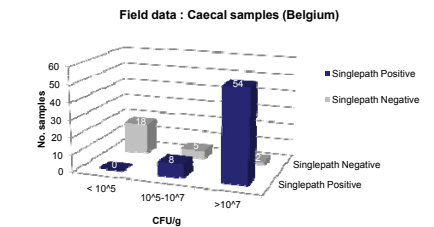
Study 1: On-Farm Field Trial (Faecal Droppings), Austria (n=180 samples)

PCR & Singlepath® samples un-paired.
Overall agreement with q-PCR: 90.6%
Sensitivity (% correctly classified positive): 88.9%
Specificity (% correctly classified negative): 91.0%



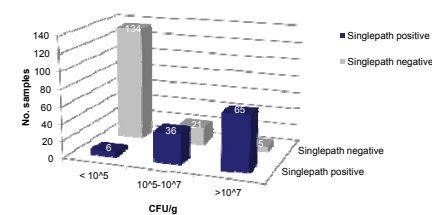
Study 2: On-Farm (Caecal Droppings) (n=24 samples) and Slaughterhouse Field Trial (Caecal Contents), Belgium (n=63 samples)

Overall agreement with Plate count: 93.1%
Sensitivity (% correctly classified positive): 92.4%
Specificity (% correctly classified negative): 95.2%

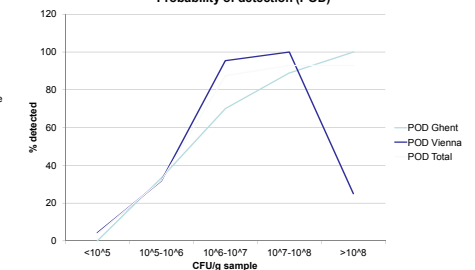


Study 1 and 2 Summary: (n=267 samples)

Field data : Caecal and faecal samples (Austria and Belgium)



Probability of detection (POD)



Summary

Singlepath® Direct Campy Poultry kit offers a convenient alternative solution to conventional methods for rapid evaluation of the *Campylobacter* status of broiler chicken flocks.

Rapid : Time-to-Result within 1 hour of sampling. Minimal handling time of 5 minutes

Sensitive : Detection of high shedding flocks ($\geq 10^7$ cfu/g faeces)

Specific : No False Positives

Simple : Easy handling and result interpretation

Low Cost : No specialised, cost intensive equipment

Flexible : Can be tested in field or laboratory on faecal or caecal samples

Further field trials ongoing on-farm and at slaughter. Planned market launch Q3, 2013.