

Evaluation of five protocols for detection and isolation of *Campylobacter* from different matrices

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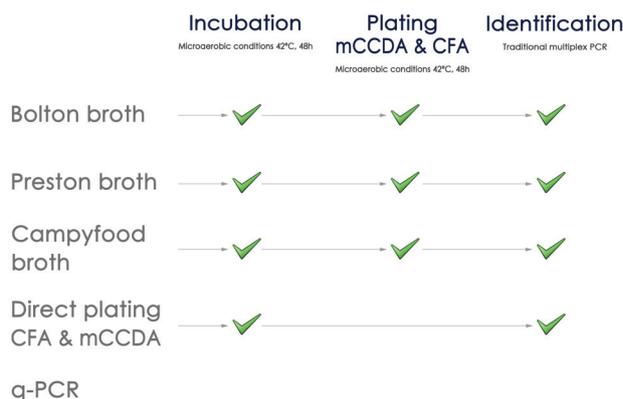
Introduction

Campylobacter jejuni and *Campylobacter coli* are among the most common cause of bacterial gastroenteritis throughout the world. The majority of human campylobacteriosis cases are caused by handling or consumption of meat products, mainly broiler. Although *Campylobacter* normally generates a subclinical infection in human, serious complications are occasionally reported. [1,2]

Traditional culture methods for *Campylobacter* spp. isolation, including enrichment, are tedious due to the particular nature of this microorganism. Our efforts were concentrated in finding the best protocol and the most effective procedure.

Material and methods

We compared five different isolation and detection protocols, including an in-house multiplex quantitative real time PCR assay (q-PCR) for molecular detection where an internal control has been added. *Campylobacter* were isolated following four different culture methods with and without enrichment, including the part 1- ISO 10272: 2006 one.



We tested three different matrices: faeces and neck skin at slaughterhouse and packed fresh meat at consumption points (n=114 samples). Some samples of sewage water were also analysed (data not shown).

Nomenclature

mCCDA: charcoal cephaloperazone desoxycholate agar (OXOID).
CFA: Campyfood agar (bioMérieux).
CFB: Campyfood broth (bioMérieux).

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References

- Humphrey T., O'Brien S., and Madsen M. Campylobacters as zoonotic pathogens: A food production perspective. International Journal of Food Microbiology, 117(3):237-57. 2007
- Habib I., Uyttendaele M., and De Zutter L. Evaluation of ISO 10272:2006 standard versus alternative enrichment and plating combinations for enumeration and detection of *Campylobacter* in chicken meat. Food Microbiology, 28(6):1117-23. 2011

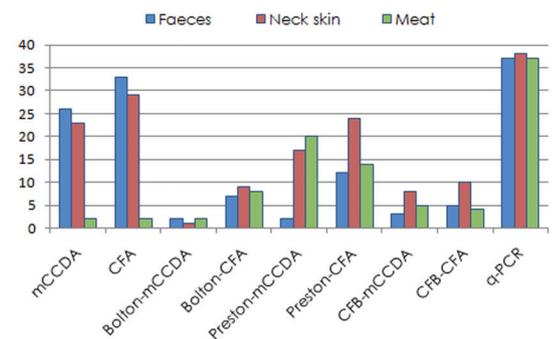
Results

Table 1. Summary of the performance of the five protocols used for detection of *Campylobacter*.

| Protocol | Positive detection rate (%) |
|---------------|-----------------------------|
| mCCDA | 45.5 |
| CFA | 57.1 |
| Bolton-mCCDA | 4.5 |
| Bolton-CFA | 21.4 |
| Preston-mCCDA | 34.8 |
| Preston-CFA | 44.6 |
| CFB-mCCDA | 14.3 |
| CFB-CFA | 16.9 |
| q-PCR* | 100 |

*Real-time PCR showed to be highly sensitive (112 positives samples of a total of 114), so we have considered it as the reference protocol to evaluate the others methods.

Figure 2. *Campylobacter* recovery using five protocols from all the matrices.



Conclusions

- q-PCR has proven to be the best protocol for the *Campylobacter* detection.
- Direct plating on CFA provided the highest number of *Campylobacter* isolates from faeces and neck skin samples.
- Enrichment in Preston broth and subsequent plating on mCCDA provided the highest recovery from meat samples.
- The former ISO10272: 2006 protocol provided the lowest isolation rate from all the matrices.
- Enrichment with Preston broth and plating on CFA showed a successful recovery of *Campylobacter* for all matrices.
- Direct plating gave us fast and consistent recovery from samples with high contamination levels (faeces and neck skin) in contrast to meat samples.
- New selective agar (CFA) showed to be a straightforward way of detecting *Campylobacter*.