

# RAPID DETECTION OF *Campylobacter jejuni* BY REAL-TIME PCR AND IMMUNOMAGNETIC SEPARATION

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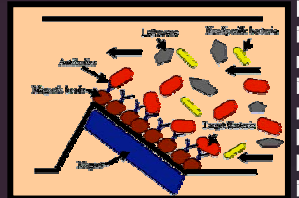
## Introduction

*Campylobacter jejuni* is a food-borne pathogen considered to be the leading cause of acute bacterial diarrhea world-wide. It can be primarily found in a wide range of foods including poultry, pigs and beef.



The traditional detection of this microorganism using culture-based methods is time-consuming, laborious and difficult to adapt for quantitative analysis. Therefore, it is necessary to implement new detection methods which present high reproducible sensitivity, marked specificity, and speed.

Real-time PCR is an alternative method that improves both productivity and analytical flexibility to detect pathogens in food. The use of a separation method as a pre-treatment step avoids the possible reaction inhibition due to the complex food matrix.



Pathatrix is an immunomagnetic separation method which allows the isolation of cells from the food matrix. As shown in the figure beside, the beads are attracted by a magnet while the sample is recirculated. The beads capture the cells using an antibody.

## Objective

The objective of this study is to improve detection of *C. jejuni* in food samples using Pathatrix and real-time PCR.

## Materials and Methods



Chicken Sample



1. Enrichment



2. Processing (Pathatrix, Matrix Microscience, Inc.)

3. Real-time detection (Lightcycler, Roche).



## Results

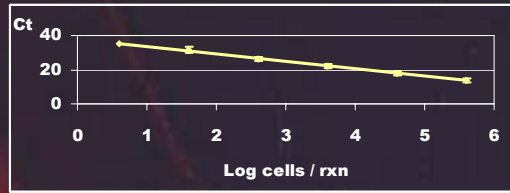


Figure 1. Quantitative analysis of DNA extracted from a *C. jejuni* culture by boiling. The slope of the curve was - 4.3 and the regression coefficient was 0.999.

Time (h)	Inoculum	
	10 <sup>6</sup> CFU	10 <sup>4</sup> CFU
4	+	+
6	+	+
8	+	+
12	+	+
24	-	+

Figure 2. Detection of *C. jejuni* in spiked chicken samples using Pathatrix system and real-time PCR (+, detectable; -, non-detectable).

	Incubation time	Ct value	CFU / ml
Spiked samples	24 h	24.09 ± 1.188	1 x 10 <sup>3</sup>
Naturally contaminated samples	24 h	30.99 ± 0.091	1 x 10 <sup>1</sup>

Figure 3. Detection of *C. jejuni* in spiked and naturally contaminated chicken samples.

## Conclusions

- ♦ *Campylobacter jejuni* can be detected in spiked samples in less time than the protocol indicated by the Pathatrix manufacturer (2-3 days).
- ♦ The use of real-time PCR speeds the detection up in more than 60% (less than 24 h).
- ♦ In naturally contaminated samples, the enrichment appears necessary in order to allow the cells recovery and detection.

The use of both systems, Pathatrix and real-time PCR seems a better option to detect *C. jejuni* in food samples. The future work in this study is to investigate another protocol in order to improve the detection time by more than 60%.

## Acknowledgments

- ♦ Rocío Morales-Rayas is a CONACyT-Mexico scholarship holder. Scholarship No. 158410.
- ♦ Pussadee Tangwacharin for her technical support.