



## ORIGINAL ARTICLE

## The Prevalence of *Clostridium difficile* and *Clostridium perfringens* in Minced and Ground Beef in Iran

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## KEYWORDS

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Meat;  
PCR;  
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**ABSTRACT:** In this study, due to the importance of human societies, the prevalence of *Clostridium difficile* and *Clostridium perfringens* in minced and ground beef was investigated in Qazvin city, Iran. All samples were collected randomly by sampling method. The number of samples taken was estimated based on statistical methods and according to previous studies. *Clostridium difficile* moxalactam norfloxacin (CDMN) culture media was used to isolate *Clostridium difficile* and TCS Agar and TPGY culture media was used for *Clostridium perfringens*. After isolation, a PCR (Polymerase Chain Reaction) test was used to confirm the species diagnosis. According to the results, 21.26% of all samples were infected with these two bacteria. The prevalence of *Clostridium perfringens* (18.04%) was significantly ( $p < 0.05$ ) higher than *Clostridium difficile* (3.22%). Given the results and the pathogenicity of *Clostridium* species, especially *Clostridium difficile* and *Clostridium perfringens*, special attention should be paid to the methods reducing the contamination of these pathogenic bacteria in raw food.

## INTRODUCTION

*Clostridia* are anaerobic, gram-positive, and spore-producing bacilli important for pathogenesis, especially food-borne diseases [1]. *Clostridia* are widely distributed in nature and they can be considered a food-borne pathogen important to public health because of their abilities to produce spores, grow very rapidly in food, and produce toxins. *Clostridia* are found everywhere in the environment, including in the soil (as the main source), the bodies of animals and humans, plants and vegetables. Therefore, due to their presence in the environment, the

probability of disease in humans and animals is very high [2, 3].

The pathogenic potential of *Clostridium perfringens* is attributed to their ability to produce at least 29 types of toxins and enzymes. *C. perfringens* are classified into five different types (A, B, C, D, and E) based on their ability to produce four major deadly toxins, including alpha, beta, iota, and epsilon [4, 5]. *C. perfringens* require various amino acids for growth and survival, which are essential for

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