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Assessment of *Listeria monocytogenes* in pet food

Lesley Maurice Bilung^{*†}, Victoria Ulok[†], Feven Mehari Tesfamariam[†] and Kasing Apun[†]

Abstract

Background: *Listeria monocytogenes* is one of the commonly isolated foodborne pathogens which cause illness, and listeriosis is a disease caused by this pathogen in human beings. Pets that consume contaminated pet food diets can be colonized by *L. monocytogenes* without showing clinical signs making the pets a possible source of contamination in the household. This study aimed to detect and enumerate the presence of *L. monocytogenes* in pet food diets, namely cat and dog food.

Result: A total of 32 samples consisting of wet food (25%), dry food (25%), treats (25%), and leftover household samples (25%) were examined for this study. The pet food diets were sampled from pet food shops, grocery stores, and households located in Kuching and Kota Samarahan. The analysis was conducted using the most probable number–polymerase chain reaction (MPN-PCR). According to the results obtained from MPN-PCR, none of the samples were contaminated by *L. monocytogenes*.

Conclusion: Being the first biosafety assessment of *L. monocytogenes* in pet food in Malaysia, this study can contribute to the building of a database regarding the potential contamination of pet food diets by *L. monocytogenes*.

Keywords: *Listeria monocytogenes*, Most probable number–polymerase chain reaction, Pet food

Background

Listeria monocytogenes is recorded to be one of the numerous foodborne pathogens that cause foodborne illness [13]. It is rod-shaped, non-spore forming, facultative anaerobe and gram-positive bacteria which are known to be an opportunistic intracellular pathogen. Listeriosis is a rare but a serious foodborne disease which is caused by the pathogen *L. monocytogenes*. When compared to other foodborne pathogens such as *Salmonella*, listeriosis is known to have high fatality rates (20–30%). Even though *L. monocytogenes* cause a mild gastroenteritis in healthy adults, the illness can be severe in immunocompromised individuals, pregnant women, infants, and the elderly. *Listeria* species are tolerant to extreme conditions such as low temperature, high salt concentration, and low pH.

As a result, they are present in a variety of environments which include water, sewage, effluents, silage, soil, and foods [8].

Pet food is a food intended for pet consumption, and the pet food diets used in this research were foods for cats and dogs. The cat/dog food samples are commercially prepared dry food, wet food, and treats and leftover household foods. *L. monocytogenes* can cause infection in both cats and dogs. In some cases, these companion animals show no symptoms, but they continue to shed *L. monocytogenes* in their stool causing zoonotic health threat [17]. Although rare cases of listeriosis in companion animals, especially dogs and cats, have been reported, some clinical manifestations have been observed such as abortion, septicaemia with encephalomyelitis, or cutaneous form [3, 14, 20, 21, 24]. According to US Food and Drug Administration [23], several recalls of pet food diets had been made due to the fear of potential contamination by *L. monocytogenes*. The contamination of commercially prepared pet food diets by *L. monocytogenes* has been reported in many cases, especially in the USA

*Correspondence: mblesley@unimas.my

†Lesley Maurice Bilung, Victoria Ulok, Feven Mehari Tesfamariam, and Kasing Apun contributed equally to this work
Department of Molecular Biology, Faculty of Resource Science and Technology, Universiti Malaysia Sarawak, 94300 Kota Samarahan, Sarawak, Malaysia