

UNIVERSITI TEKNOLOGI MARA

**MPN-DUPLEX PCR DETECTION
FOR *Salmonella* spp.
CONTAMINATION AND SURVIVAL
IN COCONUT MILK**

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MSc

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AUTHOR'S DECLARATION

I declare that the work in this thesis was carried out in accordance with the regulations of Universiti Teknologi MARA. It is original and is the results of my own work, unless otherwise indicated or acknowledged as referenced work. This thesis has not been submitted to any other academic institution or non-academic institution for any degree or qualification.

I, hereby, acknowledge that I have been supplied with the Academic Rules and Regulations for Post Graduate, Universiti Teknologi MARA, regulating the conduct of my study and research.

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ABSTRACT

Salmonella spp. was the most common cause to human Salmonellosis worldwide in the recent years. Up to October 2018, a total of 83 cases of *Salmonella* strain outbreak in Malaysia had been identified. The epidemiologic investigation done before had showed a significant association between consumption of local food containing coconut milk and gastrointestinal symptoms in Malaysia. The purpose of this study was to investigate the presence and susceptibility of *Salmonella* spp. and *Salmonella* Typhimurium in fresh coconut milk at retail level in Negeri Sembilan, Malaysia. A simulation of decontamination was also conducted to provide the best handling practices while storing a fresh coconut milk. A total of 120 samples, were randomly purchased from hypermarket and wet market all around Kuala Pilah, Seremban and Senawang areas at over one year period (March 2014 until October 2015). The range of the detection of *Salmonella* spp. in the sample were ranged from 3.0×10^4 to 2.4×10^7 MPN/ml. However, the highest microbial loads was found to be at the hypermarket and wet market in Kuala Pilah with 2.4×10^7 MPN/ml, respectively. A combination technique of most probable number and duplex polymerase chain reaction (MPN-PCR) method was used then to quantify on the prevalence and number of total *Salmonella* spp. in the fresh coconut milk in Negeri Sembilan, Malaysia. The prevalence of *Salmonella* spp. was 74.2% followed by *Salmonella* Typhimurium with 29.2% from all the three sampling areas respectively. Here, the highest detection of 85% was for *Salmonella* spp. from Seremban and Senawang wet market samples. A slightly low detection of 50% was detected of the *Salmonella* Typhimurium from Seremban hypermarket and wet market samples. Meanwhile, the lowest presence of 15% were found from the Senawang hypermarket and wet market with 15%. A simulation study was conducted to overcome the final problem of situation found *Salmonella* spp. in the fresh coconut milk. The three treatment were conducted in this simulation. It was found in domestic kitchen as much as to give a realistic quantitative load on how to reduced that Treatment 3, by adding 2 gram of NaCl_2 and boiled up to 60°C for 10 minutes able to reduce the number of *Salmonella* spp culture after treatment to 3.0×10^4 CFU/ml. In conclusion, we found out that fresh coconut milk was easily been contaminated and thus pose a risk for consumers. Further studies on a bigger scale are recommended to understand the risks when handling and consuming a contaminated fresh coconut milk.

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