

Detection of *Salmonella* spp. from Fresh and Unpasteurized Cow Milk

Che Ku Adam Che Ku Rosdi^a, Ernie Eileen Rizlan Ross^{a*}

Structured Abstract

Background: *Salmonella* spp. is a rod-shaped, Gram-negative facultative anaerobe with a high importance towards general public health. It can cause salmonellosis and can bring economic burden such as the loss of manpower. There is also the rising concern of multidrug-resistant strains being recorded globally. This study focuses on the collection of fresh and unpasteurized cow milk from different local source to detect the prevalence of *Salmonella* along with the quality of milk samples obtained. The purpose of this study is to investigate the prevalence of *Salmonella* spp. in the milk samples and assess its biochemical and antibiotic susceptibility profiles.

Methods: Fresh and unpasteurized milk was obtained from three different local sources. A six-series serial dilution was made with one mL sample and nine mL nutrient broth diluent. The total bacterial count and presence of *Salmonella* was checked on nutrient agar and *Salmonella Shigella* agar (SSA) for 24 and 48 hours respectively. Positive isolates were obtained from SSA and several biochemical tests were conducted such as catalase, Simmons citrate, urease, motility, and Triple Sugar Iron (TSI) tests. An antibiotic susceptibility test was conducted towards positive isolates obtained using the Kirby-Bauer disc diffusion method and a range of selected antibiotics.

Results: This study shows that *Salmonella* is present within the milk samples. All fresh and unpasteurized milk samples were found to exceed the limits to be regarded as good quality via several standards placed. Positive *Salmonella* isolates were confirmed via cultural, biochemical, and Gram staining techniques where they mostly aligned with general *Salmonella* characteristics. Antibiotic susceptibility test results showed that most antibiotics were either resisted or inhibited by *Salmonella* with an exception for netilmicin. This indicated that *Salmonella* isolates from local milk samples were slightly more resistant towards available antibiotics than recorded in literature.

Conclusion: In conclusion, *Salmonella* is present in local milk samples even though at a lower prevalence than other bacteria. The findings of this study showed that *Salmonella* isolates from the milk samples harboured a slightly higher antibiotic resistance than recorded. This information could be potentially used for further studies regarding multidrug-resistant strains found in milk samples.

Keywords: *Salmonella* Prevalence, Cow Milk, Milk Quality, Multidrug Resistance, Antibiotic Susceptibility

*Correspondence: ernie974@uitm.edu.my

^a School of Biology, Faculty of Applied Sciences, Universiti Teknologi MARA, Shah Alam, Malaysia