

Colloquium on Applied Sciences 2024

19-21 January 2024, Faculty of Applied Sciences, UiTM Shah Alam, Malaysia

## **Antimicrobial Resistance and Characterization of *Staphylococcus aureus* Isolated from Raw Subclinical Mastitis Milk Samples AT A Selected Private Dairy Farm, In Alor Gajah, Melaka**

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### **Structured Abstract**

**Background:** The antimicrobial resistance (AMR) uprising has caused global public health issue concerns. Various study shows that *S. aureus* shows adaptability to new conditions and environments, which means it is crucial for surveillance of their virulence and antibiotic resistance mechanisms. One of the origins of the transmission of AMR is *via* indirect and direct pathways due to farming industry practices. However, one of the challenging factors that could jeopardize dairy production in dairy industries is the prevalence of Mastitis in dairy animals. Mastitis can affect the production and quality of milk, leading to economic losses to the industries. In addition, subclinical Mastitis can become a reservoir for AMR pathogens, which can threaten public health. *Staphylococcus aureus* is the most prevalent pathogen ubiquitous in subclinical raw milk. There are many studies claiming *S. aureus* has developed resistance against antimicrobial drugs due to misuse of antibiotics and poor management practices of herd dairy animals. This phenomenon will jeopardize current antibiotic treatment as milk heavily becomes a part of people's diets. This study aims to study the prevalence of *S. aureus* in raw milk samples in Alor Gajah, Melaka and to characterize its AMR pattern characteristics based on antimicrobial resistance profiles and the capability of production biofilm formation.

**Methods:** The methods that were used in this study were collection of raw milk, mastitis testing using CMT, isolation and identification of *S. aureus* by using macroscopic and microscopic screening, biochemical test, Antimicrobial Susceptibility Test, biofilm formation assay and 16s rDNA sequencing.

**Results:** This study shows that AMR *S. aureus* was present and identified from the raw subclinical mastitis milk from the selected dairy farm at Alor Gajah Melaka. The AMR *S. aureus* was resistant to tetracycline, penicillin, and ampicillin. Most of the isolates expected to be *Staphylococci spp.* of this study show resistance to the antibiotic beta-lactam groups (oxacillin, penicillin, and ampicillin) followed by ciprofloxacin and tetracycline.

**Conclusion:** In conclusion, this study can provide valuable insight into the status of antimicrobial resistance and effective intervention measures for antimicrobial-resistant development in the selected dairy farm.

**Keywords:** AMR, Mastitis, *S. aureus*

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