ISOLATION AND IDENTIFICATION OF *Staphylococcus aureus* IN PASTEURISED AND UHT MILK WITH DIFFERENT FLAVORS AND PACKAGING

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ABSTRACT

SHAMITRA THYAGARAJAN. Isolation and Identification of *Staphylococcus aureus* in Pasteurized and UHT Milk with Different Flavors and Packaging. Supervised by RAHMAT HIDAYAT and EVA HARLINA

Staphylococcus aureus is a pathogenic bacterium known for its' ability to survive in dairy products, posing significant risk to public health despite the application of high-temperature treatments such as pasteurization and UHT processing. Recognizing the vulnerability of milk-based products to contamination, this study aimed to isolate and identify *S.aureus* in pasteurized and UHT milk with different packaging available in the market in Dramaga, Bogor. A total of seventeen samples were evaluated in three separate batches, each with different expiry dates. The chosen flavors were original, chocolate and strawberry based on availability in the market. Isolation was performed using Mannitol Salt Agar, followed by confirmatory biochemical tests including Gram staining, catalase test, glucose fermentation and mannitol fermentation. The results revealed the presence of *S. aureus* in three samples from UHT milk from the first batch across all flavors tested. Approximately 5.9% of the test results were positive for *Staphylococcus aureus*. The total plate count of positive samples ranged from 1.0×10^1 to 1.0×10^3 CFU/ml indicating variation in contamination levels likely relating to packaging types and post-processing handling. No *S. aureus* was found in pasteurized milk or in other batches of UHT milk, which aligns with national standards for microbial limit in Indonesia. Key findings indicated that potential sources of contamination included inadequate hygiene practices, manufacturing and processing errors, suboptimal storage conditions, and possible human errors during the handling and analysis of samples.

Keywords: flavored milk, hygiene, milk contamination, pasteurized milk, *Staphylococcus aureus*, UHT milk

ABSTRAK

SHAMITRA THYAGARAJAN. Isolasi dan Identifikasi *Staphylococcus aureus* dalam Susu Pasteurisasi dan UHT dengan Berbagai Rasa dan Kemasan. Dibimbing oleh RAHMAT HIDAYAT dan EVA HARLINA

Staphylococcus aureus merupakan bakteri patogen yang dikenal karena kemampuannya bertahan hidup dalam produk susu, sehingga menimbulkan risiko yang signifikan terhadap kesehatan masyarakat meskipun telah diberi perlakuan suhu tinggi seperti pasteurisasi dan UHT. Menyadari kerentanan produk berbasis susu terhadap kontaminasi, penelitian ini bertujuan untuk mengisolasi dan mengidentifikasi *S.aureus* dalam susu pasteurisasi dan UHT dengan kemasan berbeda yang tersedia di pasaran di Dramaga, Bogor. Sebanyak tujuh belas sampel dievaluasi dalam tiga kelompok terpisah, masing-masing dengan tanggal kedaluwarsa yang berbeda. Rasa yang dipilih adalah original, coklat dan stroberi berdasarkan ketersediaan di pasaran. Isolasi dilakukan dengan menggunakan Mannitol Salt Agar, diikuti dengan uji biokimia termasuk pewarnaan Gram, uji katalase, fermentasi glukosa dan fermentasi manitol. Hasil penelitian menunjukkan adanya *S. aureus* dalam tiga sampel dari susu UHT dari kelompok pertama di semua rasa yang diuji. Sekitar 5,9% dari hasil uji positif mengandung *Staphylococcus aureus*. Jumlah total sampel positif berkisar antara 1.0×10^1 hingga 1.0×10^3 CFU/ml, yang menunjukkan variasi tingkat kontaminasi yang kemungkinan terkait dengan jenis kemasan dan penanganan pasca-pemrosesan. Tidak ditemukan *S. aureus* dalam susu yang dipasteurisasi atau dalam kelompok susu UHT lainnya, sejalan dengan standar nasional untuk batas mikroba di Indonesia. Diduga potensial kontaminasi meliputi praktik kebersihan yang tidak memadai, kesalahan produksi dan pemrosesan, kondisi penyimpanan yang tidak optimal, dan kemungkinan kesalahan manusia selama penanganan dan analisis sampel.

Kata kunci: higiene, kontaminasi susu, susu beraroma, susu pasteurisasi *Staphylococcus aureus*, susu UHT

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The author believes this scientific paper will be useful for those in need and for the advancement of science in this industry.

Bogor, July 2025

Shamitra Thyagarajan

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