

**PENGARUH NANOEMULSI MINYAK ATSIRI KAYU MANIS
(*Cinnamomum burmannii*) TERHADAP KUALITAS
KIMIA DAN MIKROBIOLOGIS DAGING
SAPI PERANAKAN ONGOLE**

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INTISARI

Daging sapi PO (Peranakan Ongole) merupakan bahan makanan sumber protein yang mudah mengalami kerusakan. Penelitian ini bertujuan untuk menentukan efektivitas nanoemulsi minyak atsiri kayu manis dengan lama penyimpanan terhadap kualitas kimia dan mikrobiologis daging sapi PO. Nanoemulsi tersebut diformulasikan menggunakan *Nanoemulsifying Drug Delivery System* (SNEDDS) dengan konsentrasi 0,625%; 1,25%; 2,5%; dan 5%. Pengujian kualitas kimia dilakukan dengan metode *Near Infrared Reflectance Spectroscopy* (NIRS) dan *Total Plate Count* (TPC). Pengujian kualitas kimia dan mikrobiologis dilakukan pada penyimpanan hari ke-0, 4, 8, dan 12. Hasil data dianalisis dengan Rancangan Acak Lengkap (RAL) pola faktorial 5x4. Data yang memberikan perbedaan nyata, maka dilakukan uji lanjut menggunakan uji *Duncan's Multiple Range Test* (DMRT). Hasil penelitian menunjukkan bahwa konsentrasi nanoemulsi memberikan pengaruh nyata terhadap penurunan kadar air dan kadar lemak, serta peningkatan kadar protein dan kadar kolagen. Konsentrasi nanoemulsi minyak atsiri kayu manis 5% mampu menurunkan nilai total mikroba hingga $5,45 \pm 0,10$ log CFU/g dan menghasilkan cemaran salmonella negatif. Lama penyimpanan memberikan pengaruh nyata terhadap kualitas kimia dan mikrobiologis daging sapi PO. Interaksi terbaik terdapat pada konsentrasi 5% nanoemulsi minyak atsiri kayu manis yang dapat mempertahankan kualitas kimia dan mikrobiologis daging sapi PO hingga penyimpanan hari ke-12 pada suhu refrigerator dengan nilai rerata kadar air 73,53%, kadar protein 22,23%, kadar lemak 4,30%, kadar kolagen 1,88%, total mikroba 5,45 log CFU/g, dan cemaran salmonella negatif.

Kata kunci: Daging sapi PO, Kualitas kimia, Kualitas mikrobiologis, Minyak atsiri kayu manis, Nanoemulsi

THE EFFECT OF CINNAMON (*Cinnamomum burmannii*) ESSENTIAL OIL NANOEMULSION ON THE CHEMICAL AND MICROBIOLOGICAL QUALITY OF PERANAKAN ONGOLE BEEF

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ABSTRACT

PO (Peranakan Ongole) beef was a protein-rich food material that was highly susceptible to deterioration. This study aimed to determine the effectiveness of cinnamon essential oil nanoemulsion and storage duration on the chemical and microbiological quality of PO beef. The nanoemulsion was formulated using a Nanoemulsifying Drug Delivery System (SNEDDS) with concentrations of 0.625%, 1.25%, 2.5%, and 5%. Chemical quality testing was conducted using the Near Infrared Reflectance Spectroscopy (NIRS) method, while microbiological quality was evaluated using the Total Plate Count (TPC) method. Chemical and microbiological analyses were performed on storage days 0, 4, 8, and 12. The data were analyzed using a Completely Randomized Design (CRD) with a 5×4 factorial pattern, and data showing significant differences were further analyzed using Duncan's Multiple Range Test (DMRT). The results showed that nanoemulsion concentration significantly affected the reduction of moisture and fat contents, as well as the increase of protein and collagen contents. The 5% cinnamon essential oil nanoemulsion concentration was able to reduce the total microbial count to 5.45 ± 0.10 log CFU/g and produced negative Salmonella contamination results. Storage duration significantly affected the chemical and microbiological quality of PO beef. The best interaction was observed in the 5% cinnamon essential oil nanoemulsion treatment, which was able to maintain the chemical and microbiological quality of PO beef until the 12th day of refrigerated storage, with average values of 73.53% moisture content, 22.23% protein content, 4.30% fat content, 1.88% collagen content, 5.45 log CFU/g total microbial count, and negative Salmonella contamination.

Keywords: Chemical quality test, Cinnamon essential oil, Nanoemulsion, Peranakan Ongole beef, Total plate count.