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Kualitas Fisik Susu Mentah Sapi Peranakan Friesian Holstein selama Penyimpanan dalam Freezer di Peternakan X, Yogyakarta
Nur Halisa, Febri Ariyanti, S.Pt., M.Sc.
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KUALITAS FISIK SUSU MENTAH SAPI PERANAKAN *FRIESIAN HOLSTEIN* SELAMA PENYIMPANAN DALAM *FREEZER* DI PETERNAKAN X, YOGYAKARTA

Oleh:

NUR HALISA
22/505711/SV/21890

INTISARI

Susu sapi mentah merupakan bahan pangan dengan kandungan nutrien tinggi seperti protein, lemak, laktosa, vitamin, dan mineral. Kandungan nuitrisi yang tinggi menjadikan susu sebagai bahan pangan mudah rusak (*perishable food*) karena dapat mendukung pertumbuhan mikroorganisme. Kerusakan susu dapat disebabkan oleh penyimpanan, aktivitas mikroorganisme, dan reaksi enzimatis. Penyimpanan susu dalam suhu rendah dapat digunakan sebagai salah satu cara untuk memperlambat penurunan kualitas susu sehingga tetap terjaga kualitasnya. Penyusunan Tugas Akhir ini bertujuan untuk mengetahui kualitas susu sapi mentah PFH di Peternakan X, Yogyakarta selama penyimpanan dalam *freezer* dalam hal kualitas fisik susu (berat jenis, pH, dan uji organoleptik). Desain penelitian menggunakan Rancangan Acak Kelompok Lengkap (RAKL) dengan empat kelompok perlakuan lama penyimpanan (H0, H1, H2, H3). Sampel susu berasal dari empat ekor sapi (A, B, C, D) yang memenuhi kriteria dan tidak menderita mastitis. Sampel susu mentah sebanyak satu liter dikoleksi dari masing-masing sapi. Koleksi sampel susu dilakukan satu kali setiap Senin pagi pukul 07:00-09:00 WIB selama enam minggu. Setiap sampel susu kemudian dialikuot ke dalam empat wadah sesuai kelompok perlakuan penyimpanan. Setiap periode pengambilan sampel terdapat 16 unit perlakuan yang terdiri atas empat perlakuan dan empat ulangan sehingga diperoleh 96 unit perlakuan (6x16). Analisis data dilakukan menggunakan perangkat lunak Jamovi melalui analisis deskriptif, uji normalitas *Shapiro-Wilk*, visualisasi Q-Q plot, *One-Way* ANOVA dilanjutkan dengan uji *Tukey*, serta uji *Kruskal-Wallis* yang dilanjutkan dengan *Dwass-Steel-Critchlow-Fligner* (DSCF). Berat jenis susu menunjukkan perbedaan ($p < 0,05$) pada sampel susu sapi B dan D ($1,0267 \pm 0,0004^{a}$ dan $1,0273 \pm 0,0005^{a}$). Parameter pH menunjukkan perbedaan signifikan ($p < 0,05$) selama periode penyimpanan yaitu pada sampel susu sapi A ($6,53 \pm 0,0176^{a}$), B ($6,61 \pm 0,0248^{a}$), C ($6,57 \pm 0,0172^{a)}$, D ($6,57 \pm 0,0197^{a}$). Hasil uji organoleptik warna, aroma, rasa, dan konsistensi susu sapi mentah PFH sesuai dengan SNI 3141:2024. Hasil penelitian menunjukkan penyimpanan susu mentah sapi PFH dalam *freezer* (H0, H1, H2, H3) bersuhu -4°C mampu mempertahankan sebagian besar kualitas fisik susu mentah pada penyimpanan hari ke-2 (H2).

Kata kunci: berat jenis, organoleptik, penyimpanan *freezer*, pH, susu sapi mentah

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PHYSICAL QUALITY OF FRESH MILK FROM FRIESIAN HOLSTEIN COWS DURING STORAGE IN THE FREEZER AT FARM X, YOGYAKARTA

By:

NUR HALISA
22/505711/SV/21890

ABSTRACT

Raw cow's milk is a food ingredient with high nutrient content such as protein, fat, lactose, vitamins, and minerals. The high nutrient content can support the growth of microorganisms and trigger chemical reactions, making milk a perishable food. Milk spoilage can be caused by storage, microbial activity, and enzymatic reactions. Storing milk at low temperatures can be used as a way to slow down the decline in milk quality so that its quality is maintained. However, information about changes in the physical quality of raw Peranakan Friesian Holstein (PFH) cow milk during daily freezer storage is still limited. The purpose of this Final Project is to examine the quality of PFH raw cow milk at Farm X, Yogyakarta during freezer storage in terms of physical quality (specific gravity, pH, and organoleptic tests). The research design uses a Completely Randomized Group Design (CRGD) with four storage time treatment groups (H0, H1, H2, H3). The milk samples came from Farm X, which has a total of six dairy cows, from which four cows (A, B, C, D) were selected that met the criteria and were free from mastitis. Each milk sample was then divided into four containers according to the storage treatment group. One liter of raw milk was collected from each cow. Milk sample collection was done once every Monday morning from 07:00 to 09:00 WIB for six weeks. For each sampling period, there were 16 treatment units consisting of four treatments with four repetitions, resulting in a total of 96 treatment units (6x16). Data analysis was carried out using Jamovi software through descriptive analysis, Shapiro-Wilk normality test, Q-Q plot visualization, One-Way ANOVA followed by Tukey's test, as well as the Kruskal-Wallis test followed by Dwass-Steel-Critchlow-Fligner (DSCF). The milk's specific gravity showed differences ($p < 0.05$) In cow's milk B and D (1.0267 ± 0.0004a and 1.0273 ± 0.0005a). The pH parameter showed a significant difference ($p < 0.05$) during the storage period: cow's milk A (6.53 ± 0.0176a), B (6.61 ± 0.0248a), C (6.57 ± 0.0172a), D (6.57 ± 0.0197a). The results of the organoleptic tests for color, aroma, taste, and consistency of PFH raw cow's milk were in accordance with SNI 3141:2024. The study results showed that storing PFH raw cow's milk in a freezer (H0, H1, H2, H3) at -4°C could maintain most of the physical quality of the raw milk by the second day of storage (H2).

Keywords: specific gravity, organoleptic, freezer storage, pH, raw cow's milk.