

PENGARUH FORMULA MEDIA TUMBUH *Pediococcus acidilactici* BE MENGGUNAKAN WHEY POWDER TERHADAP NILAI pH, KEASAMAN DAN MIKROBIOLOGIS PRODUK SUSU SAPI FERMENTASI

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INTISARI

Penelitian ini bertujuan untuk mengetahui pengaruh formulasi media tumbuh *Pediococcus acidilactici* BE pada media dengan kombinasi *whey powder*, ekstrak tomat, dan ekstrak kacang hijau terhadap nilai pH, keasaman, dan total Bakteri Asam Laktat susu sapi fermentasi. Penelitian dilakukan mencakup dua tahapan, yaitu seleksi media tumbuh untuk pertumbuhan *Pediococcus acidilactici* BE dan mengaplikasikan media tumbuh terseleksi untuk penyiapan inokulum fermentasi susu. Formulasi media tumbuh *Pediococcus acidilactici* BE antara lain MRS *broth* (P1) sebagai kontrol, *whey powder* 100% (P2), *whey powder* 50% + ekstrak tomat 50% (P3), dan *whey powder* 50% + ekstrak tomat 45% + ekstrak kacang hijau 5% (P4). Media tumbuh P1, P2, P3, dan P4 diseleksi berdasarkan nilai pH, keasaman, dan total BAL. Pengamatan dilakukan sebanyak tiga kali pengulangan pada jam ke-0, 4, 10, 16, dan 22. Penelitian dilakukan menggunakan Rancangan Acak Lengkap (RAL) pola faktorial 4x5. Hasil data dengan perbedaan nyata ($P < 0.05$) dilanjutkan dengan *Duncan's Multiple Range Test* (DMRT) dengan taraf signifikansi $\alpha = 0.05$. Media tumbuh terseleksi digunakan untuk penyiapan inokulum untuk fermentasi susu. Kualitas susu fermentasi asal inokulum berbeda diuji nilai pH, keasaman, dan total BAL. Data pengujian produk susu fermentasi dengan asal inokulum berbeda dianalisis menggunakan *independent sample* (t-test). Hasil pengujian menunjukkan formulasi media tumbuh memberikan perbedaan nyata ($P < 0.05$) terhadap nilai keasaman dan pH, tetapi tidak memberikan pengaruh yang nyata ($P > 0.05$) terhadap viabilitas *Pediococcus acidilactici* BE. Asal inokulum yang berbeda (P1 dan P3) memberikan pengaruh yang nyata ($P < 0.05$) terhadap kualitas susu fermentasi, meliputi nilai pH, keasaman, dan total BAL.

Kata kunci: *Whey*, susu, kacang hijau, buah tomat, *Pediococcus acidilactici* BE.

**THE EFFECT OF FORMULATION GROWTH MEDIUM FOR
Pediococcus acidilactici BE USING WHEY POWDER ON THE pH,
ACIDITY, AND MICROBIOLOGY OF FERMENTED COW'S MILK**

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ABSTRACT

This study aimed to determine the effect of growth medium formulations for *Pediococcus acidilactici* BE using a combination of whey powder, tomato extract, and mung bean extract on the pH value, acidity, and total Lactic Acid Bacteria (LAB) in fermented cow's milk. The research consisted of two stages: selecting a growth medium for the cultivation of *Pediococcus acidilactici* BE and applying selected medium for inoculum preparation in milk fermentation. The formulations for growth medium included MRS broth (P1) as the control, 100% whey powder (P2), 50% whey powder + 50% tomato extract (P3), and 50% whey powder + 45% tomato extract + 5% mung bean extract (P4). The growth media (P1, P2, P3, and P4) were evaluated based on pH, acidity, and total LAB. Observations were conducted in triplicate at 0, 4, 10, 16, and 22 hours. The study utilized a Completely Randomized Design (CRD) with a 4x5 factorial pattern. Data showing significant differences ($P < 0.05$) were further analyzed using Duncan's Multiple Range Test (DMRT) with significance level of $\alpha = 0.05$. Selected growth medium was used to prepare the inoculum for milk fermentation. Quality of fermented milk from different inoculum sources was assessed in terms of pH, acidity, and total LAB, with data analyzed using an independent sample t-test. The results showed that growth medium formulations significantly affected ($P < 0.05$) acidity and pH but did not significantly influence ($P > 0.05$) viability *Pediococcus acidilactici* BE. Different inoculum sources (P1 and P3) significantly affected ($P < 0.05$) pH value, acidity, and total LAB of fermented milk.

Keywords: Whey, milk, mung bean, tomato, *Pediococcus acidilactici* BE.