

ABSTRACT

ANALYSIS OF THE EFFECT OF PROBIOTIC *LACTOBACILLUS CASEI* BEVERAGE ON HEMOGLOBIN LEVELS IN ANEMIC MALE *MUS MUSCULUS*

By

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Background: Anemia is a global health condition affecting approximately one-third of the world's population, with the highest prevalence in developing countries. There are around 136 million cases of anemia in children, 248 million in women of reproductive age, and 16 million in pregnant women, with iron deficiency anemia (IDA) accounting for half of all anemia cases. Beyond its significant health impacts, anemia caused approximately 24,000 global deaths in 2016. Probiotic therapy, such as with *Lactobacillus casei*, has been explored as an alternative approach to increase hemoglobin levels in individuals with anemia, due to its potential synergistic effect in supporting iron absorption.

Method: This study employed a true laboratory experimental design with pre-test and post-test methods. A total of 40 male mice (*Mus musculus*), aged 3–4 months, were randomly selected and treated with *Lactobacillus casei* probiotics over six weeks (September–October 2024). Hemoglobin levels were measured before and after the intervention.

Results: Statistical analysis using the Shapiro-Wilk test for data normality and the Kruskal-Wallis test for significance indicated a significant relationship between *Lactobacillus casei* administration and increased hemoglobin levels in anemic mice ($p < 0.05$). Post hoc analysis using the Dunn test showed a significant difference in hemoglobin levels between the treatment and control groups.

Conclusion: The administration of *Lactobacillus casei* probiotics showed a significant positive correlation with increased hemoglobin levels in anemic mice models, suggesting its potential as an adjunct therapy in anemia treatment.

Keywords: Anemia, hemoglobin, *Lactobacillus casei*, *Mus musculus* mice, probiotics

ABSTRAK

ANALISIS PENGARUH MINUMAN PROBIOTIK *LACTOBACILLUS CASEI* TERHADAP KADAR HEMOGLOBIN PADA MENCIT *MUS MUSCULUS* JANTAN ANEMIA

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Latar Belakang: Anemia adalah kondisi kesehatan global yang mempengaruhi sekitar sepertiga populasi dunia, dengan prevalensi tertinggi di negara berkembang. Terdapat sekitar 136 juta kasus anemia pada anak-anak, 248 juta pada wanita usia reproduktif, dan 16 juta pada ibu hamil, dengan anemia defisiensi besi (ADB) yang menyumbang setengah dari seluruh kasus anemia. Selain dampak kesehatan yang signifikan, anemia menyebabkan sekitar 24.000 kematian global pada tahun 2016. Terapi probiotik, seperti *Lactobacillus casei*, mulai diteliti sebagai pendekatan alternatif untuk meningkatkan kadar hemoglobin pada penderita anemia, terutama karena potensi efek sinergisnya dalam mendukung penyerapan zat besi.

Metode: Penelitian ini menggunakan desain *true laboratory experimental* dengan metode *pre-test* dan *post-test*. Sebanyak 40 mencit (*Mus musculus*) jantan berusia 3–4 bulan dipilih secara acak dan diberi perlakuan probiotik *Lactobacillus casei* selama enam minggu (September–Oktober 2024). Pengukuran kadar hemoglobin dilakukan sebelum dan sesudah intervensi.

Hasil: Analisis statistik menggunakan uji *Saphiro-Wilk* untuk normalitas data dan uji *Kruskal-Wallis* untuk uji signifikansi menunjukkan bahwa pemberian *Lactobacillus casei* berhubungan signifikan dengan peningkatan kadar hemoglobin pada mencit dengan anemia ($p < 0,05$). Analisis *post-hoc* dengan uji *Dunn* mengindikasikan perubahan kadar hemoglobin yang signifikan antara kelompok perlakuan dan kontrol.

Kesimpulan: Pemberian probiotik *Lactobacillus casei* menunjukkan hubungan positif yang signifikan terhadap peningkatan kadar hemoglobin pada model mencit dengan anemia, menunjukkan potensi sebagai pengobatan pendamping pada terapi anemia.

Kata Kunci: Anemia, hemoglobin, *Lactobacillus casei*, mencit *Mus musculus*, probiotik