

ABSTRACT

THE EFFECT OF PROBIOTIC INTAKE ON BODY WEIGHT, BODY LENGTH, AND INSULIN-LIKE GROWTH FACTOR-1 LEVELS IN UNDERNUTRITION MODEL RATS (*Rattus norvegicus*)

By

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Background: *Undernutrition is a global health problem characterized by impaired physical growth and decreased Insulin-like Growth Factor-1 (IGF-1) levels. Gut microbiota dysbiosis is known to contribute to its pathophysiology. Probiotics can modulate gut microbiota and are expected to improve growth parameters. This study aimed to analyze the effect of probiotic intake on body weight, body length, and IGF-1 levels in an undernourished rat (*Rattus norvegicus*) model.*

Methods: *This experimental study used a posttest-only controlled group design. Twenty-eight male Sprague Dawley rats were divided into four groups: Normal Control (KN), Normal Control + Probiotics (KN-P), Undernourished (KKG), and Undernourished + Probiotics (KKG-P). The undernourished groups received a diet with 30% less feed than the normal groups. The measured parameters were body weight, body length, and plasma IGF-1 levels. Data were analyzed using One-Way ANOVA and Tukey's post-hoc test.*

Results: *The KKG group showed significantly lower mean body weight (101 ± 12.60 g), body length (17.0 ± 0.548 cm), and IGF-1 levels (16.3 ± 2.03 ng/mL) than the KN group. Probiotic administration in the KKG-P group increased the mean values for all three parameters, but the differences were not statistically significant compared to the KKG group ($p > 0.05$). The highest significant increase in IGF-1 was observed in the KN-P group (28.8 ± 3.52 ng/mL).*

Conclusion: *Probiotic intake showed a tendency to improve growth parameters in undernourished rats, though not significantly. This finding suggests that probiotics have potential as an adjuvant therapy but cannot replace adequate nutritional intake.*

Keywords: *Body Length, Body Weight, Insulin-like Growth Factor 1 Probiotics, Undernutrition, *Rattus norvegicus**

ABSTRAK

PENGARUH ASUPAN PROBIOTIK TERHADAP BERAT BADAN, PANJANG BADAN, DAN *KADAR INSULIN-LIKE GROWTH FACTOR-1* TIKUS (*Rattus norvegicus*) MODEL KURANG GIZI

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Latar Belakang: Kurang gizi merupakan masalah kesehatan global yang ditandai dengan terhambatnya pertumbuhan fisik dan penurunan kadar *Insulin-like Growth Factor-1* (IGF-1). Disbiosis mikrobiota usus diketahui berperan dalam patofisiologi kondisi ini. Probiotik berpotensi memodulasi mikrobiota usus sehingga diharapkan dapat memperbaiki parameter pertumbuhan. Penelitian ini bertujuan menganalisis pengaruh asupan probiotik terhadap berat badan, panjang badan, dan kadar IGF-1 pada tikus (*Rattus norvegicus*) model kurang gizi.

Metode: Penelitian eksperimental ini menggunakan desain *posttest only controlled group*. Dua puluh delapan tikus jantan Sprague Dawley dibagi menjadi empat kelompok: Kontrol Normal (KN), Kontrol Normal + Probiotik (KN-P), Kurang Gizi (KKG), dan Kurang Gizi + Probiotik (KKG-P). Kelompok kurang gizi menerima pakan 30% lebih rendah dari kelompok normal. Parameter yang diukur adalah berat badan, panjang badan, dan kadar IGF-1 plasma. Data dianalisis menggunakan *One-Way ANOVA* dan uji *post-hoc Tukey*.

Hasil: Kelompok KKG menunjukkan rerata berat badan (101 ± 12.60 g), panjang badan (17.0 ± 0.548 cm), dan kadar IGF-1 (16.3 ± 2.03 ng/mL) yang signifikan lebih rendah dari kelompok KN. Pemberian probiotik pada kelompok KKG-P meningkatkan rerata ketiga parameter, namun tidak signifikan secara statistik dibandingkan kelompok KKG ($p > 0.05$). Peningkatan kadar IGF-1 tertinggi secara signifikan terdapat pada kelompok KN-P (28.8 ± 3.52 ng/mL).

Kesimpulan: Asupan probiotik menunjukkan kecenderungan meningkatkan parameter pertumbuhan pada tikus kurang gizi, namun tidak signifikan. Temuan ini mengindikasikan probiotik berpotensi sebagai terapi adjuvan, tetapi tidak dapat menggantikan pemenuhan nutrisi yang adekuat

Kata Kunci: Berat Badan, *Insulin-like Growth Factor 1*, Kurang Gizi, Panjang Badan, Probiotik, *Rattus norvegicus*