

**Suplementasi Kacang Bambara (*Vigna subterranean* (L.) Verdc.) terhadap  
Struktur Histologis Otot Skelet Mencit (*Mus musculus* Linnaeus, 1758)  
dengan Pakan Rendah Protein**

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**INTISARI**

Defisiensi protein menyebabkan kerusakan jaringan dan perubahan struktur histologis pada otot skelet. Hal ini berdampak pada terhambatnya pertumbuhan dan penyusutan massa tubuh dan dapat mencapai separuh dari ukuran normal. Asupan protein berfungsi untuk mencegah penyusutan massa tubuh sekaligus memperbaiki kondisi otot skelet setelah mengalami kerusakan. Kacang bambara dengan kandungan asam amino esensial dapat menjadi solusi untuk mengatasi permasalahan tersebut. Penelitian ini dilakukan bertujuan untuk mengkaji pengaruh suplementasi kacang bambara (*Vigna subterranean* (L.) Verdc.) terhadap struktur histologis otot skelet mencit (*Mus musculus* L.) defisiensi protein. Penelitian menggunakan 25 ekor mencit betina dengan 1 kelompok kontrol dan 4 kelompok perlakuan. Mencit diberi pakan kontrol, defisiensi protein, atau defisiensi protein dengan suplementasi kacang bambara selama 2 bulan. Kemudian, otot skelet bagian *gastrocnemius* dikoleksi dengan metode parafin dan pewarnaan Hematoksin-Eosin. Parameter pengamatan berupa pengukuran morfometri dan skoring kerusakan jaringan otot skelet. Hasil menunjukkan perbedaan signifikan antara kelompok kontrol dengan defisiensi protein pada luas fasikulus, luas serabut otot, diameter serabut otot, dan jumlah serabut otot. Pada kelompok perlakuan suplementasi kacang bambara, perbedaan signifikan hanya tampak pada parameter luas fasikulus, luas serabut otot, dan diameter serabut otot. Pengamatan kerusakan jaringan menunjukkan bahwa defisiensi protein mengakibatkan otot skelet mengalami degenerasi dan *splitting* myofiber. Pemberian suplementasi kacang bambara menunjukkan proses regenerasi sel dengan tampaknya inti di bagian tengah serabut otot skelet. Dengan demikian, kacang bambara terbukti mampu mencegah dan memperbaiki kerusakan struktur histologis otot skelet mencit defisiensi protein.

**Kata kunci:** defisiensi protein, kacang bambara, mencit, otot skelet, struktur histologis.

## Bambara Groundnut (*Vigna subterranean* (L.) Verdc.) Supplementation on The Histological Structure of Mice's (*Mus musculus* Linnaeus, 1758) Skeletal Muscle with Low Protein Diet

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### ABSTRACT

Protein deficiency causes tissue damage and changes in the histological structure of skeletal muscle. This is causing stunted growth and reduced body mass up to half of normal. The importance of fulfilling protein intake serves to prevent reducing of body mass and improve the condition of skeletal muscle after damage. Bambara groundnuts which contain essential amino acids can be a solution to overcome this problem. This research was aimed to examine the effect of bambara groundnut (*Vigna subterranean* (L.) Verdc.) supplementation on the histological structure of skeletal muscle of protein-deficient mice (*Mus musculus* L.). The research used 25 female mice with 1 control group and 4 treatment group. Mice were given standard, protein-deficient, or protein-deficient diet supplemented with bambara groundnut for 2 months. Then, the skeletal muscle of the gastrocnemius was collected using the paraffin method and Hematoxylin-Eosin staining. Observation parameters include tissue morphometric measurements, tissue damage scoring, and the histological structure of skeletal muscle tissue. The results of this study showed that there were significant differences between the control group with protein deficiency in fasciculus area, muscle fiber area, muscle fiber diameter, and muscle fiber number. In the bambara groundnut supplementation treatment group, significant differences were only seen in the parameters of fasciculus area, muscle fiber area and muscle fiber diameter. The results showed that protein deficiency causes skeletal muscle to undergo myofiber degeneration and splitting. Bambara groundnut supplementation showed a cell regeneration process with apparently nuclei in central of skeletal muscle fibers. Thus, bambara groundnuts were proven to be able to prevent and repair damage to the histological structure of skeletal muscle in protein-deficient mice.

**Keywords:** protein deficiency, bambara groundnut, mice, skeletal muscle, histological structure