

PENGARUH PEMBERIAN BEKATUL TERFERMENTASI TERHADAP EKSPRESI GEN AKT2 OTOT SKELET TIKUS WISTAR JANTAN MODEL DIABETES MELITUS

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INTISARI

Latar belakang: Diabetes melitus (DM) dicirikan oleh terjadinya hiperglikemia dan resistensi insulin yang di antaranya berkaitan dengan penurunan aktivasi Akt2. Akt2 merupakan protein yang salah satunya banyak diekspresikan di otot skelet. Bekatul mengandung antioksidan dan serat yang diketahui bermanfaat dalam penanganan diabetes dan jumlahnya meningkat dengan fermentasi. Pemberian bekatul terfermentasi terbukti dapat menurunkan kadar gula darah pada tikus model diabetes melitus tetapi mekanismenya terhadap pengambilan glukosa di otot skelet masih belum diketahui.

Tujuan: Mengetahui pengaruh pemberian bekatul terfermentasi terhadap ekspresi gen *Akt2* otot skelet tikus diabetes melitus.

Metode: Sebanyak 30 ekor tikus Wistar jantan dibagi ke dalam 6 kelompok: 1) kontrol, 2) kontrol negatif (tikus DM), 3) tikus DM+diet bekatul 10%, 4) tikus DM+diet bekatul 20%, 5) tikus DM+diet bekatul terfermentasi 10%, dan 6) tikus DM+diet bekatul terfermentasi 20%. Induksi diabetes melitus menggunakan injeksi intraperitoneal nikotinamid (NA) 230 mg/kg BB diikuti streptozotisin (STZ) 65 mg/kg BB. Perlakuan pada hewan coba telah dilakukan pada penelitian sebelumnya. Analisis ekspresi gen *Akt2* menggunakan metode *Real Time Quantitative Polymerase Chain Reaction* (qPCR) pada jaringan otot skelet yang telah diambil.

Hasil: Tidak ada perbedaan signifikan secara statistik ekspresi gen *Akt2* antarkelompok perlakuan ($p > 0,05$).

Kesimpulan: Pemberian bekatul terfermentasi tidak mempengaruhi ekspresi gen *Akt2* otot skelet tikus diabetes melitus.

Kata kunci: Bekatul terfermentasi, diabetes melitus, Akt2, protein kinase B, streptozotisin-nikotinamid

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EFFECT OF FERMENTED RICE BRAN ON AKT2 GENE EXPRESSION IN SKELETAL MUSCLE OF MALE WISTAR RATS WITH DIABETES MELLITUS

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ABSTRACT

Background: Diabetes mellitus (DM) is characterized by hyperglycemia and insulin resistance which is related to the downregulation of Akt2 enzyme. Skeletal muscle is one of the tissues where Akt2 is highly expressed. Rice bran is beneficial for diabetes management due to its antioxidants and dietary fiber content which are increased with fermentation. Previous study proved that rice bran can lower blood glucose in diabetic rat model but its effect on the mechanism of glucose uptake in skeletal muscle is still unknown.

Objectives: To determine the effect of fermented rice bran on *Akt2* gene expression in skeletal muscle of male Wistar rats with diabetes mellitus

Method: Thirty male Wistar rats were grouped into: 1) normal control, 2) negative control (DM), 3) DM+ 10% rice bran, 4) DM+ 20% rice bran, 5) DM+ 10% fermented rice bran, and 6) DM+20% fermented rice bran. Diabetes mellitus was induced by intraperitoneal injection of 230 mg/kg BW nicotinamide (NA) followed by 65 mg/kg BW streptozotocin (STZ). Induction of diabetes and administration of rice bran for 4 weeks has been done in the previous study and skeletal muscles were collected. Skeletal muscle gene expression of *Akt2* was measured with *Real Time Quantitative Polymerase Chain Reaction* (qPCR).

Result: There is no statistically significant difference of *Akt2* gene expression between groups ($p > 0,05$).

Conclusion: Administration of fermented rice bran does not affect *Akt2* gene expression in skeletal muscle of diabetic rats.

Keywords: Fermented rice bran, diabetes mellitus, Akt2, protein kinase B, streptozotocin-nicotinamide

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