

## **PENGARUH KACANG MERAH FERMENTASI DAN INULIN UMBI DAHLIA TERHADAP KADAR GLUKOSA DARAH PADA TIKUS WISTAR DIABETES MELITUS**

Atika Nurul Haniyyah<sup>1</sup>, Perdana Samekto T.S<sup>2</sup>, Emy Huriyati<sup>2</sup>

### **INTISARI**

**Latar belakang :** Kondisi diabetes mellitus (DM) menyebabkan peningkatan kadar glukosa darah (Hiperglikemia) Untuk itu kontrol glukosa darah menjadi penting untuk menghindari komplikasi DM yakni melalui pengaturan makan kaya serat dan antioksidan. Salah satunya adalah kacang merah yang rendah indeks glikemik yang ditingkatkan sifat gizi dan fungsionalnya melalui fermentasi serta inulin dari umbi dahlia kaya manfaat prebiotik.

**Tujuan :** Mengetahui pengaruh kacang merah fermentasi dan inulin (KFI), perbedaan pengaruh kacang merah fermentasi(KF) dengan kacang merah(K), perbedaan pengaruh penambahan inulin pada kacang merah dan kacang merah fermentasi(KI dan KFI) dengan K dan KF terhadap penurunan kadar glukosa darah pada kondisi DM.

**Metode :** Jenis penelitian *true* eksperimental *pre* dan *post test* dengan kelompok kontrol. Tepung kacang merah difermentasi oleh *B.subtilis* FNCC 0060 (24 jam, suhu 42<sup>0</sup>C). Inulin umbi dahlia diekstraksi dengan etanol 80% dan diendapkan (18 jam, suhu 0-(-18)<sup>0</sup>C). KM/KMF sebanyak 26% mensubstitusi kasein dan tepung gandum dan inulin sebanyak 3.7% mensubstitusi tepung gandum pada diet *semi-purified*. Tikus model DM dengan injeksi STZ-NA. Perlakuan selama 28 hari dengan 30 ekor tikus dibagi menjadi 6 kelompok yakni kontrol sehat, kontrol DM, P1(DM+K), P2(DM+KI), P3(DM+KF), dan P4(DM+KFI). Darah diambil sebelum dan sesudah perlakuan untuk dilakukan analisis kadar glukosa darah puasa (GDP) dengan metode enzimatis GOD-PAP kolorimetris.

**Hasil :** Kadar GDP *post-test* berbeda nyata <0.001 pada semua kelompok perlakuan P1,P2,P3 dan P4. P4 memiliki penurunan kadar GDP paling tinggi dibandingkan kelompok yang lain . P3 lebih banyak menurunkan GDP sebesar 162 mg/dl (60.98%) daripada P1 sebesar 124 mg/dl (47.13%). P2 dan P4 lebih banyak menurunkan GDP sebesar 152 mg/dl (56,99%) dan 170.52 mg/dl (64.52%).

**Simpulan :** KMF menurunkan kadar GDP paling tinggi. KMF lebih banyak menurunkan kadar GDP daripada KM. KMI dan KMF lebih banyak menurunkan kadar GDP daripada KM dan KMF.

**Kata Kunci :** Diabetes melitus, kacang merah fermentasi, *bacillus subtilis*, inulin umbi dahlia, kadar glukosa darah.

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<sup>1</sup>Mahasiswa Program Studi Gizi Kesehatan FK-KMK Universitas Gadjah Mada

<sup>2</sup>Dosen Program Studi Gizi Kesehatan FK-KMK Universitas Gadjah Mada

## EFFECT OF FERMENTED RED BEAN AND INULIN DAHLIA TUBER ON BLOOD GLUCOSE LEVEL IN MALE WISTAR RAT WITH DIABETES MELLITUS

Atika Nurul Haniyyah<sup>1</sup>, Perdana Samekto T.S<sup>2</sup>, Emy Huriyati<sup>2</sup>

### ABSTRACT

**Background** : The condition of DM causes an increase in blood glucose levels (hyperglycemia). For that, blood glucose control is important to avoid complications of DM, by regulating eating food rich in dietary fiber and antioxidants. One of them is the low-glycemic index red beans that have improved nutritional and functional through fermentation and inulin from dahlia tubers rich in prebiotic benefits.

**Objective** : To determine the effect of red beans and inulin fermentation (KMF1), differences in the effect of fermented red beans (KMF) with red beans (KM), differences in influencing inulin in red beans and red bean fermentation (KMI and KMF1) with KM and KMF for replacement levels blood glucose in DM conditions.

**Methods** : : This type of research is true experimental pre and post test with the control group. Red bean flour is fermented by *B. subtilis* FNCC 0060 (24 hours, 42°C). Inulin dahlia tubers were extracted with 80% ethanol and precipitated (18 hours, temperature 0 - (- 18)°C). 26% of KM / KMF substituted casein and wheat flour and inulin as much as 3.7% substituted wheat flour on a semi-purified diet. DM model mouse with STZ-NA injection. Treatment for 28 days with 30 rats divided into 6 groups consisted of healthy controls, DM control, P1 (DM + KM), P2 (DM + KMI), P3 (DM + KMF), and P4 (DM + KMF1). Blood was taken before and after the treatment to analyze blood glucose levels by colorimetric GOD-PAP enzymatic method.

**Result** : Blood glucose post-test levels were significantly different <0.001 in all treatment groups P1, P2, P3 and P4. P4 has the largest decrease in blood glucose level compared to other groups. P3 decreases blood glucose level by more than 162 mg / dl (60.98%) than P1 by 124 mg / dl (47.13%). P2 and P4 reduce blood glucose level by more than 152 mg / dl (56.99%) and 170.52 mg / dl (64.52%).

**Conclusion** : KMF1 decreases the largest blood glucose level. KMF more lowers blood glucose levels than KM. KMI and KMF1 reduce the level of blood glucose more than KM and KMF.

**Keyword** : Diabetes mellitus, fermented red beans, *bacillus subtilis*, dahlia tuber inulin, blood glucose level.

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<sup>1</sup>Undergraduate student of Health Nutrition Dept. FK-KMK Universitas Gadjah Mada

<sup>2</sup>Lecturer of Health Nutrition Dept. FK-KMK Universitas Gadjah Mada