PENGARUH PEMBERIAN FOYA (*Fermentation of Soybean with Aerobic and Anaerobic Process)* TERHADAP EKSPRESI mRNA *Irs*-2 DAN NILAI HOMA-IR PADA MENCIT MODEL DIABETES MELITUS TIPE 2

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INTISARI

Diabetes melitus tipe 2 merupakan penyakit kronis yang menjadi masalah serius di masyarakat. Pemberian obat secara terus menerus kepada pasien DM tipe 2 dapat menimbulkan efek samping tertentu. Kedelai memiliki banyak zat aktif seperti senyawa isoflavon yang berpotensi menurunkan kadar glukosa darah. Kedelai dengan fermentasi aerobik dan anaerobik dapat memperoleh banyak zat bioaktif. Penelitian ini bertujuan untuk mengukur nilai HOMA-IR dan ekspresi mRNA Irs-2 pada hewan model DMT2 yang menerima FOYA. Tiga puluh mencit digunakan untuk model hewan DMT2 dan dipisahkan menjadi 5 kelompok, Non DM, DM, DM+FOYA 10mg, DM+FOYA 20 mg dan DM+FOYA 40 mg. Mencit diinduksi Streptozotocin dan Nicotinamide (STZ-NA) dengan lama perlakuan 21 hari. Data yang dikumpulkan adalah kadar glukosa darah, kadar insulin, Nilai HOMA-IR, dan ekspresi mRNA Irs-2. Kadar insulin diukur dengan ELISA dan ekspresi mRNA Irs-2 diukur dengan RT-PCR. Data dianalisis dengan ANOVA dengan $p<0,05$ sebagai batas signifikansi. FOYA mampu menurunkan kadar glukosa darah. FOYA dengan dosis 40 mg mampu menurunkan kadar glukosa darah tertinggi menjadi 159 ± 1,515 mg/dL. Dosis FOYA 20 mg memiliki kadar insulin yang lebih tinggi (57,44± 8.132) dan nilai HOMA-IR normal lebih banyak dibandingkan kelompok diabetes lainnya yaitu 2,84±0,33 dengan dosis FOYA 20 mg. Ekspresi mRNA Irs-2 pada kelompok yang mendapat FOYA lebih rendah dibandingkan dengan kelompok kontrol diabetes. FOYA dengan dosis 10, 20 dan
40 mg tidak dapat meningkatkan ekspresi Irs-2. FOYA dapat meningkatkan nilai HOMA-IR, kadar glukosa darah tetapi tidak berpengaruh terhadap peningkatan ekspresi gen *Irs-2*

Keywords: FOYA,GABA,Soybean,Tempe,Isoflavones,HOMA-IR, *Irs-2*, DMT2

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THE EFFECT OF FOYA (*Fermentation of Soybean with Aerobic and Anaerobic Process)* ON IRS-2 mRNA EXPRESSION AND HOMA-IR VALUE IN TYPE 2 DIABETES MELLITUS ANIMAL MODEL

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ABSTRACT

Background: Diabetes mellitus type 2 was a chronic disease being a serious problem in society. Continuous given of drugs to type 2 DM patients can cause certain side effects. Soybeans have many active substances such as isoflavone compounds that have the potential to lower blood glucose levels. Soybeans with aerob and anaerob fermentation can get many substances bioactive. The aim of this study is to measuring HOMA-IR value and *Irs-2* mRNA expression in animal model DMT2 that received FOYA.

Methods: Thirty mice were using for DMT2 animal model and separate in to 5 groups, Non DM, DM, DM+FOYA 10mg, DM+FOYA 20 mg and DM+FOYA 40 mg. Mice was induced by Streptozotocin and Nicotinamide (STZ-NA) with duration treatment in 21 days. Data collected was blood glucose levels, insulin levels, HOMA-IR Value, and *Irs-2* mRNA expression. Insulin level was measuring with ELISA and *Irs-2* mRNA expression was measuring with RT- PCR. Data were analyzed by ANOVA with $p < 0.05$ as the limit of significance.

Results: FOYA was able to reduce blood glucose levels. FOYA with dosage of 40 mg was able to reduce highest blood glucose levels to 159 ± 1.515 mg/dL. The dose of 20 mg FOYA had a higher levels of insulin (57.44± 8,132) and HOMA-IR value normal more than another diabetes groups is 2.84 ± 0.33 with 20 mg dosage of FOYA. *Irs-2* mRNA expression in the group that received FOYA was lowest than diabetes control group. FOYA with dosage 10, 20 and 40 mg can't promote expression of *Irs-2*.

Conclusion: FOYA could improve HOMA-IR value, blood glucose levels but not affected for increased *Irs-2* gene expression

Keywords: FOYA,GABA,Soybean,Tempe,Isoflavones,HOMA-IR, *Irs-2*, DMT2