PENGARUH PEMBERIAN SUSU *MULTIGRAIN* TERHADAP TIKUS DIABETES DAN PENGEMBANGAN SUSU *MULTIGRAIN* INSTAN SEBAGAI PANGAN FUNGSIONAL

YASMIN AZZAHRA

2321132003

Dosen Pembimbing:
Prof. Dr. Ir. Fauzan Azima, M.S
Prof. Dr. Ir. Rini, M.P

FAKULTAS TEKNOLOGI PERTANIAN
UNIVERSITAS ANDALAS
PADANG
2025

PENGARUH PEMBERIAN SUSU MULTIGRAIN TERHADAP TIKUS DIABETES DAN PENGEMBANGAN SUSU MULTIGRAIN INSTAN SEBAGAI PANGAN FUNGSIONAL

Yasmin Azzahra, Fauzan Azima, Rini

ABSTRAK

Penelitian ini bertujuan untuk menganalisis tren publikasi mengenai grain dan hubungannya dengan diabetes secara bibliometrik, mengevaluasi pengaruh susu multigrain dengan penambahan oleoresin *Cassiavera* terhadap parameter diabetes pada tikus, serta mengkaji potensi pengembangan susu multigrain instan sebagai pangan fungsional. Kajian bibliometrik dilakukan terhadap publikasi ilmiah tahun 2014–2024 menggunakan aplikasi VOSviewer. Uji in vivo dilakukan pada empat kelompok tikus diabetes selama enam minggu dengan parameter meliputi berat badan, glukosa darah postprandial, kadar TNF-α dan IL-6, profil lipid serum, jumlah dan persentase leukosit, aktivitas dan kapasitas makrofag, serta histopatologi pankreas. Formulasi susu multigrain instan menggunakan Rancangan Acak Lengkap (RAL) dengan lima perlakuan dan tiga ulangan, yaitu penambahan maltodekstrin pada konsentrasi 2%, 4%, 6%, 8%, dan 10%. Data dianalisis secara statistik menggunakan ANOVA dan dilanjutkan dengan Duncan's New Multiple Range Test (DNMRT) pada taraf 5%. Hasil menunjukkan peningkatan signifikan publikasi terkait grain sebagai pangan fungsional untuk diabetes dalam lima tahun terakhir. Pemberian susu multigrain secara signifikan menstabilkan glukosa darah, meningkatkan berat badan, menekan inflamasi, meningkatkan sistem imun dan kadar HDL, serta mencegah kerusakan pulau Langerhans akibat hiperglikemia. Formulasi terbaik adalah penambahan maltodekstrin 10% dengan komposisi gizi dan fungsional optimal. Nilai gizi meliputi kadar air 4,43%, abu 0,81%, protein 11,84%, lemak 9,95%, karbohidrat 72,82%, energi 489,02 kkal, serat 9,52%, aktivitas antioksidan (IC_{50}) 68,02 ppm, indeks glikemik 112,79, dan beban glikemik 16,29. Kajian lanjutan disarankan untuk mengeksplorasi potensi susu multigrain dalam mengatasi komplikasi diabetes serta penggunaan bahan enkapsulan dengan indeks glikemik lebih rendah.

Kata kunci : bibliometrik; cassiavera; diabetes; grain; pangan fungsional

EFFECT OF MULTIGRAIN MILK SUPPLEMENTATION ON DIABETIC RATS AND DEVELOPMENT OF INSTANT MULTIGRAIN MILK AS FUNCTIONAL FOOD

Yasmin Azzahra, Fauzan Azima, Rini

ABSTRACT

This study aims to analyze publication trends on grains and their relationship with diabetes using bibliometric methods, evaluate the effects of multigrain milk supplemented with *Cassiavera* oleoresin on diabetic parameters in rats, and explore the potential development of instant multigrain milk as a functional food. The bibliometric review was conducted on scientific publications from 2014 to 2024 using the VOSviewer application. An in vivo test was carried out on four groups of diabetic rats over six weeks, with parameters including body weight, postprandial blood glucose, TNF-α and IL-6 levels, serum lipid profile, leukocyte count and percentage, macrophage activity and capacity, and pancreatic histopathology. The formulation of instant multigrain milk used a Completely Randomized Design (CRD) with five treatments and three replications, namely the addition of maltodextrin at concentrations of 2%, 4%, 6%, 8%, and 10%. Data were statistically analyzed using ANOVA followed by Duncan's New Multiple Range Test (DNMRT) at a 5% significance level. The results showed a significant increase in publications related to grains as functional foods for diabetes over the past five years. The administration of multigrain milk significantly stabilized blood glucose, increased body weight, suppressed inflammation, enhanced the immune system and HDL levels, and prevented damage to the islets of Langerhans due to hyperglycemia. The best formulation was the addition of 10% maltodextrin, which provided optimal nutritional and functional composition. Nutritional values included moisture content of 4.43%, ash 0.81%, protein 11.84%, fat 9.95%, carbohydrates 72.82%, energy 489.02 kcal, fiber 9.52%, antioxidant activity (IC_{50}) of 68.02 ppm, glycemic index 112.79, and glycemic load 16.29. Further studies are recommended to explore the potential of multigrain milk in addressing diabetes complications and the use of encapsulating agents with lower glycemic indices.

Keywords: bibliometric; cassiavera; diabetes; functional food; grain