STUDI PEMANFAATAN STRAIN PROBIOTIK ASAL MANUSIA DALAM PRODUK SUSU FERMENTASI SEBAGAI ANTIHIPERGLIKEMIA DAN PENURUN KOLESTEROL PADA TIKUS SPRAGUE DAWLEY

INTISARI

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Penelitian ini bertujuan untuk mengevaluasi strain bakteri asam laktat (BAL) asal manusia dalam produk susu fermentasi sebagai antihiperglikemia dan penurun kolesterol pada tikus Sprague Dawley (SD). Penelitian dibagi menjadi dua tahapan yaitu pengujian kualitas fisiko-kimia susu fermentasi dan percobaan secara *in vivo* pada tikus SD. Penelitian tahap pertama adalah pembuatan susu fermentasi dengan dua perlakuan yaitu: (P1) Susu fermentasi dengan starter *Lactobacillus casei* AP dan (P2) Susu fermentasi dengan starter *Lactobacillus casei* AG. Variabel yang diukur meliputi pH, *Free Fatty Acid* (FFA), kadar asam laktat, total BAL, viskositas, kadar lemak, protein, laktosa, dan air. Produk susu fermentasi dianalisis menggunakan T-Test (uji perbandingan rata-rata). Penelitian tahap kedua adalah percobaan *in vivo* menggunakan tikus putih jantan SD. Tikus dibagi dalam 5 kelompok perlakuan yaitu: (T1) Tikus diberi diet standar dan air minum *ad libitum,* (T2) Tikus diberi diet lemak tinggi, fruktosa dan aquades, (T3) Tikus diberi diet lemak tinggi, fruktosa dan setelah hari ke-120 diberi susu fermentasi (*Lactobacillus casei* AP) sebanyak 2 ml (10^8 cfu/ml) per oral, (T4) Tikus diberi diet lemak tinggi, fruktosa dan setelah hari ke-120 diberi susu fermentasi (*Lactobacillus casei* AG) sebanyak 2 ml (10^8 cfu/ml) per oral, dan (T5) Tikus diberi diet lemak tinggi, fruktosa dan setelah hari ke-120 diberi metformin dosis 45 mg/kg BB per oral (sebagai kontrol positif/antihiperglikemia). Variabel yang diukur yaitu bobot badan, kadar glukosa, kolesterol total, *Low Density Lipoprotein* (LDL), *High Density Lipoprotein* (HDL), trigliserida, dan total BAL pada feses tikus. Data hasil penelitian yang diperoleh dianalisis menggunakan rancangan split plot dan T-Test. Hasil penelitian tahap pertama menunjukkan perbedaan strain probiotik pada susu fermentasi berpengaruh tidak nyata ($P>0,05$) terhadap pH, FFA, kadar asam laktat, total BAL, kadar lemak, protein, laktosa dan air, namun berpengaruh nyata ($P<0,05$) terhadap viskositas. Hasil penelitian tahap kedua menunjukkan bahwa pemberian susu fermentasi dengan starter *Lactobacillus casei* strain AP selama 15 hari mampu menurunkan kadar glukosa, kadar kolesterol total, LDL, trigliserida, serta meningkatkan HDL dan total BAL pada feses tikus.

Kata kunci: Strain BAL, susu fermentasi, antihiperglikemia, profil lipid

STUDY ON THE UTILIZATION OF HUMAN-ORIGIN PROBIOTIC STRAINS IN FERMENTED MILK AS ANTIHYPERGLYCEMIA AND REDUCING CHOLESTEROL AT SPRAGUE DAWLEY RATS

ABSTRACT

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This study aimed to evaluate human-origin Lactic Acid Bacteria (LAB) in fermented milk as antihyperglycemia and reducing cholesterol at Sprague Dawley (SD) rats. The experiment was divided into two phases, namely testing physico-chemical quality of fermented milk and *in vivo* experiments in SD rats. The first phase of the experiment was the production of fermented milk with two treatments, namely: (P1) Fermented milk with starter *Lactobacillus casei* strain AP and (P2) Fermented milk with starter *Lactobacillus casei* strain AG. Variables measured were pH, *Free Fatty Acid* (FFA), lactic acid levels, total LAB, viscosity, fat, protein, lactose, and water content. Data of fermented milk were analyzed by T-Test (comparison test average). The second phase of the experiment was applied for *in vivo* in SD male rats. Rats were divided into 5 groups, namely: (T1) rats were fed a standard diet and water *ad libitum*, (T2) rats were fed a high fat diet, fructose, and aquadest, (T3) rats were fed a high fat diet, fructose and after 120 days were fed with fermented milk (*Lactobacillus casei* AP) at 2 ml (10^8 cfu/ml) orally, (T4) rats were fed a high fat diet, fructose and after 120 days were fed with fermented milk (*Lactobacillus casei* AG) at 2 ml (10^8 cfu/ml) orally, and (T5) rats were fed a high fat diet, fructose, and after 120 days were fed with metformin dose of 45 mg/kg orally (as a positive control/antihyperglycemia). Variables measured were body weight, blood glucose, total cholesterol, Low Density Lipoprotein (LDL), High Density Lipoprotein (HDL), triglycerides, and total LAB of rats feces. Data of the *in vivo* experiments were analyzed by split plot design and T-Test. The results of first phase showed differences of probiotic strain in fermented milk was not significant (P>0,05) on pH, FFA, lactic acid levels, total LAB, fat, protein, lactose and water content, but significant (P<0,05) on viscosity. The results of second phase *in vivo* experiments in rats showed that administration of milk fermented with *Lactobacillus casei* strain AP for 15 days were capable in lowering blood glucose, total cholesterol, LDL, triglycerides, also increases HDL and total LAB of rats feces.

Key words: LAB strain, fermented milk, antihyperglycemia, lipid profile