黃豆發酵乳對大白鼠體內抗氧化狀態與血脂之影響

Effects of soy yogurt on the antioxidative status ahd lipid metabolism in rats

中文摘要

本研究目的在探討大白鼠經四氯化碳注射前與注射後誘導氧化壓力，在飲食中添加不同含量的黃豆發酵乳粉末（黃豆蛋白經乳酸菌發酵），對大白鼠體內抗氧化酵素系統與脂質代謝的影響。實驗動物為 6 週齡健康之雄性 Sprague-Dawley 大白鼠 45 隻，隨機分為 5 組，控制組以 AIN-76 為基礎飼料，其他組別分別為添加高、低劑量之黃豆發酵乳粉末及高、低劑量牛奶發酵乳粉末取代 AIN-76 基礎飼料。實驗期為期 8 週，在四週後每組實驗動物每週於腹腔注射四氯化碳（0.2 mL/ 100g body weight)，於 0、2、4、6、8 週收集血液樣本進行分析。分析項目為--血漿總抗氧化力、紅血球之抗氧化酵素活性、脂質過氧化物、血脂、肝功能指數、飼料中與血漿中異黃酮素之含量、黃豆蛋白發酵前後之蛋白質平均分子量分佈及黃豆發酵乳粉末中抗氧化物 3-hydroxyanthranic acid (3-HAA)。結果發現，黃豆發酵乳粉末中可以偵測到抗氧化物質 3-HAA。未注射四氯化碳前，黃豆發酵乳粉末組對於血漿總抗氧化力具有正面之影響，且 catalase 之活性顯著增加。但注射四氯化碳後，黃豆發酵乳對於紅血球及肝臟之抗氧化酵素活性、脂質過氧化物之生成及血脂質則無顯著性之影響。因此，無外來氧化壓力下，攝取黃豆發酵乳對於血漿總抗氧化力具有正面之影響；但外來氧化壓力下，攝取黃豆發酵乳對於降低由四氯化碳引起之肝臟損傷之效用則不顯著。

關鍵字：黃豆發酵乳、3-hydroxyanthranic acid、總抗氧化力、脂質過氧化物

英文摘要

The objectives of this study were to investigate the effects of soy yogurt powder on the antioxidative status and lipid metabolism in CCl_4-injured rats. The animals used in the experiment were healthy male Spraque-Dawley rats that were randomly assigned into five groups according to five different diets: control (AIN-76), AIN-76 + high-dosed soy yogurt powder, AIN-76 + low-dosed soy yogurt powder, AIN-76 + high-dose milk yogurt powder and AIN-76 + low dosed milk yogurt powder. The experiment lasted for 8 weeks. After 4 weeks, each rat was received intraperitoneal administration of CCl_4 (0.2 mL/ 100 g body weight) each week. Total antioxidative status (TAS), activities of antioxidative enzymes, lipid peroxidation (TBARS), total cholesterol (TC), triglyceride (TG), glutamic oxalic transaminase (GOT), glutamic pyruvic transaminase (GPT), the content of isoflavone in the plasma and the diets, the distribution of protein molecular weight in soy yogurt powder and the antioxidant 3-hydroxyanthranic acid (3-HAA) in soy yogurt powder were

determined. Results showed that 3-HAA was found in soy yogurt powder. Before the injection of CCl_4, the consumption of high-dosed soy yogurt powder diet significantly increased TAS. After the injection of CCl_4, there was no significant difference in the activities of antioxidative enzymes. There was also no significant difference in TBARS, TC and TG between each group. In conclusion, the consumption of soy yogurt powder increased TAS before the injection of CCl_4, but it had no significant protective effect against the liver injury caused by CCl_4. Besides, 3-HAA might provide some antioxidative property for the soy yogurt powder.
Keywords: soy yogurt, 3-hydroxyanthranic acid, total antioxidative status and lipid peroxidati