大豆發酵乳對人體之腸胃菌叢及血脂之影響

The Effects of Fermented Soymilk on Human Gut Microflora and Blood Lipids

中文摘要

本研究目的在於探討大豆發酵乳是否有益於人體腸道益生菌生長，及對血脂方面是否具正面功效。第一部份爲腸道菌叢研究，篩選無腸胃道方面的疾病及其他健康問題者，年齡介於 21 至 26 歲，性別不拘，共 26 位，以交叉實驗及自體比較方式進行，爲期八週，前兩週爲排空期，接著兩週爲實驗第一期，其後兩週爲排空期，接著兩週爲實驗第二期。受試者隨機分爲兩組：YuSoy 組在第一期飲用大豆發酵乳，第二期飲用未發酵豆漿；而 SoyYu 組第一期飲用未發酵豆漿，第二期飲用大豆發酵乳 (每日攝取 500 mL 飲料)。收集糞便進行微生物活菌數檢測。結果發現飲用大豆發酵乳兩週後，受試者檢體中 Bifidobacterium spp. 及 Lactobacillus spp. 與總厭氧菌之比值，比飲用豆漿後顯著增加 ($p < 0.05$)，Clostridium perfringens 比飲用豆漿後活菌數顯著下降 ($p < 0.05$)。第二部份爲血脂研究，篩選血脂部分偏高之受試者，年齡介於 20 至 55 歲，性別不拘，共 18 位。實驗前兩週爲穩定期，接著六週爲實驗期，之後兩週爲恢復期，實驗期間每天攝取大豆發酵乳 500 mL，於實驗期第零、二、四及六週取得空腹八小時血液進行生化分析，並於實驗期第零及及六週取得在飲用大豆乳酸飲料三小時後之血液進行血漿異黃酮素分析。結果發現，血清低密度脂蛋白膽固醇 (LDL-C) 顯著降低 ($p < 0.05$)，三酸甘油酯濃度 (大於 160 mg/dL 之受試者) 顯著降低 ($p < 0.05$)，高密度脂蛋白膽固醇濃度 (小於 40 mg/dL 之受試者) 顯著增加 ($p < 0.05$)，而總膽固醇無顯著差異。在抗氧化指標方面，血漿總抗氧化力、紅血球中麩胱甘?濃度與超氧歧化?活性顯著增加 ($p < 0.05$)，紅血球中觸?活性無差異性，而血漿脂質過氧化物濃度顯著減少 ($p < 0.05$)，LDL 氧化延遲時間顯著延長 34 min ($p < 0.05$)。本篇證實飲用大豆發酵乳可增加腸道益生菌及降低有害菌之量，而飲用六週後則可促進體內抗氧化力並降低脂質過氧化物含量，對血脂濃度具有正面功效，因此大豆發酵乳對人體具有益處。

英文摘要

The objective of this study was to investigate the effects of fermented soymilk on human gut microflora and blood lipids. In section one, a cross-over clinical and self-controlled study was performed, in which 26 subjects (21-26 years of age) were randomly divided into two groups. The subjects in the YuSoy group (n = 13) drank fermented soymilk in the first experimental period, while the subjects in the SoyYu group (n = 13) drank soymilk in the first experimental period. Each subject consumed 500 mL of soy drink a day. After two weeks, in the period of fermented soymilk-drinking, the ratios of Bifidobacterium spp. to total anerobic organisms and Lactobacillus spp. to total anerobic organisms significantly increased when compared to those in the soymilk-drinking period ($p < 0.05$). The population of Clostridium perfringens significantly decreased when compared to those in the soymilk-drinking period ($p < 0.05$). In section two, a 6-wk clinical and self-controlled study was performed, in which 18 subjects (20-55 years of age) consumed 500 mL of fermented soymilk a day. Blood samples were collected. Blood lipids and antioxidative indexes were measured. After fermented soymilk consumption, the concentration of LDL-cholesterol significantly decreased ($p < 0.05$), and the concentration of triglycerides in those whose > 160 mg/dL significantly decreased ($p < 0.05$), and the concentration of HDL-cholesterol in those whose < 40 mg/dL significantly increased ($p < 0.05$). There was no difference in cholesterol. On the other hand, the concentration of plasma total antioxidant status and glutathione of RBC significantly increased ($p < 0.05$), while the superoxide dismutase activity significantly increased ($p < 0.05$). There was no difference in catalase activity of RBC. The thiobarbuturic acid reactive substrance (TBARs) significantly decreased, and the LDL-lag time significantly increased ($p < 0.05$). These findings indicated that fermented soymilk consumption significantly improved probiotic counts in the human gastrointestinal tract in a two-week period, while the antioxidative condition was improved in a six-week period.