乳酸菌發酵豆漿之抗肥胖功效

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摘要

大豆富含有豐富蛋白質與小分子胜肽，其胜肽具有降高血壓、抗氧化，抗肥胖、降血糖之功效，而乳酸菌則具有抑制腸道病原菌、降膽固醇等功效。本報告主要為探討以乳酸菌發酵豆漿之抗肥胖效果。以高脂飲食 (High-Fat Diet) 誘導肥胖之 Wistar 大鼠並分別給予 *Lactobacillus.paracasei* subsp.*paracasei* NTU 101 與 *L.plantarum* NTU 102 之發酵豆漿分別命名為 SM101 與 SM102 組，此兩組血清中的瘦體素 (Leptin) 皆有顯著提升，在 3T3-L1 細胞試驗中，此兩組別皆減少脂肪酸的攝取與累積，促進脂肪細胞縮小，其原因可能是 SM101 與 SM102 組將異黃酮轉換成木質素異黃酮 (Daidzein) 和金雀異黃酮 (Genistein) ，顯示具有抗肥胖的功效。以 *L.plantarum* P - 8 發酵之豆漿對高血脂大鼠的影響，相較於高脂飲食組 (M) ，給予發酵豆漿組別之大鼠其血液中總膽固醇 (TC)、三酸甘油脂 (TG)、低密度脂蛋白膽固醇 (LDL - C)、ApoB/ApoA - Ⅰ 指標、丙二醛含量分別降低 54%、47%、35%、44%、16%，而高密度脂蛋白膽固醇 (HDL - C)、總抗氧化能力 (T - AOC)、超氧化物歧化酶 (SOD)、麩胱甘肽過氧化物酶 (GSH - Px) 則提升 26%、50%、54%、12%，經由 H&E 染色觀察肝脂肪累積，發酵豆漿組有顯著抑制肝脂肪累積；在腸道微生物群中，*Lactobacillus*、*Bifidobacterium*、*Bacteroides*，分別提高 43%、9%、44%，*Clostridium* 群則下降 92%，結果顯示由 *L.plantarum* P-8 發酵豆漿抑制脂肪吸收且能藉由腸道微生物調節脂質代謝。此外評估 *L.* CRL981 發酵豆漿對鏈佐黴素 (Streptozotocin,STZ) 誘導糖尿病小鼠之影響，發現 STZ + SM981 組 (STZ 誘導並餵食 *L.*CRL981 發酵的豆漿) 相較 STZ 組，成長率、過氧化氫酶 (Catalase,CAT)、SOD、酵素活性提高 23%、50.5%、55.4%；血糖、糖化血色素值 (HbA1c)、LDL 值分別降低 40.2%、23.6%、20%；TC、TG 值分別降低 1.3 倍與 1.5 倍，其原因為 *L.* CRL981 具有高 β-glucoslidase 活性能完全水解豆漿中異黃酮糖苷配基使其能被生物利用，達到改善高血糖症、脂質分佈並增加抗氧化酶活性。綜合以上所述，以乳酸菌發酵之豆漿具有良好的抗肥胖與改善高血糖的潛力。

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