不同處理之精白米在有或無外源性膽固醇下對大白鼠脂質代謝的影響

The different treatment of polished rice and with or without exogenous cholesterol influence on lipid metabolism in rats

中文摘要

本研究的目的是探討生米、烹煮米及儲存米三種之不同處理的精白米中難消化澱粉在有或無添加外源性膽固醇下，對大白鼠脂質代謝的影響，並探討添加抗生素抑制大白鼠腸中之發酵作用是否會影響大白鼠脂質的代謝。實驗Ⅰ是將雄性 Wistar 隨機分成八組，分別餵予添加或不添加 1%膽固醇的玉米澱粉、生米、烹煮米及儲存米飼料。實驗Ⅱ將大白鼠分成四組，添加或不添加抗生素及添加或不添加膽固醇的儲存米飼料。實驗進行四週後，分析血清三酸甘油酯(TG)、總膽固醇(TC)、高密度脂蛋白膽固醇 (HDL-C) 及低密度脂蛋白膽固醇(LDL-C) ，肝臟之三酸甘油酯及總膽固醇，以及糞便難消化澱粉、總中性固醇與總膽酸含量。實驗Ⅰ結果顯示，在添加膽固醇情形下，烹煮米組及儲存米組均可抑制血清 LDL-C 濃度、肝臟 TC 含量的上升 ($p< 0.05$)，可增加糞便總中性固醇每日排出量 ($p< 0.05$)。糞便中難消化澱粉含量爲烹煮米組及儲存米組大於生米組。在無添加膽固醇情形下，烹煮米組及儲存米組可降低血清 LDL-C 的濃度。血清 TG、HDL-C 濃度，肝臟 TC、TG 含量及糞便排出總中性固醇與總膽酸，各組間無顯著差異($p>0.05$) 。實驗Ⅱ結果顯示，儲存米組添加抗生素，使血清 LDL-C 濃度、肝臟中 TC 含量上升($p< 0.05$) ，糞便中難消化澱粉含量明顯增加($p< 0.05$) 。由以上結果得知，在添加膽固醇下，烹煮米及儲存米抑制大白鼠體內 TC、TG 含量上升的效果比生米好，在無添加膽固醇下效果比較不明顯。儲存米組添加抗生素抑制大白鼠腸中之發酵作用後，儲存米抑制大白鼠體內 TC、TG 含量上升的效果降低。

英文摘要

The purpose of this study was to investigate resistant starch in the diffferent treatment of polished rice and with or without exogenous cholesterol influence on lipid metabolism in rats and investigate whether or not the fermentation in hind-gut of rats inhibited by antibiotics added would be influence on lipid metabolism in rats. In experiment Ⅰ, male wistar rats were randomly divided into eight groups. The eight groups include corn starch diets(+C,

-C), raw rice diets (+R, -R), cooked rice diets (+P,-P) and cook-stored rice diets(+S, -S) and with or without added 1% cholesterol. In experiment Ⅱ, male wistar rats were randomly divided into four groups. The four groups included cook-stored rice diet with (+SA, -SA) or without (+S,-S) anti-biotics and with or without added 1% cholesterol. Rats were sacrificed affter four-week feeding, and artery blood, liver and feces were collected. Analytical items included serum triglyceride (TG), total cholesterol (TC), HDL-cholesterol (HDL-C), LDL-cholesterol (LDL-C), liver triglyceride and total cholesterol, fecal neutral steroids and bile acids.

The result of experiment Ⅰ show that +P and +S had lower serum LDL-C level, liver TC content than +C ($P<0.05$). +P and +S had higher fecal neutral steroids content than +R ($P<0.05$). +P and +S had higher fecal resistant starch content than +R ($P<0.05$). -P and -S had lower serum LDL-C level than -C. Serum TG and HDL-C, liver TC, TG and fecal neutral steroids, bile acids were no significant different between -C, -R, -P and -S. The result of experiment Ⅱ show that cook-stored rice diet with antibiotics had higher serum LDL-C level and liver TC content than cook-stored diet without antibiotics. Cook-stored rice diet with antibiotics had higher resistant starch content than Cook-stored rice diet without antibiotics($P<0.05$).