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• 中文摘要

爲探討稻米中醣類對老鼠脂代謝影響而從劑本實驗研究。將 35 隻雄性 Wister 老鼠,重約二百克,隨機分成七組,其中兩組是餵以不加膽固醇的對照組(玉米澱粉)及白米組。其餘五組各添加 1%膽固醇,包括玉米加膽固醇組。白米加膽固醇組,糙米組(含 1.8%米膳食纖維)。米麩組(添加 10%脫脂米麩,含 3.7%米膳食纖維)及燕麥組(含 8.4%燕麥膳食纖維)。餵飼四週後犧牲老鼠,取動脈血及肝臟,並收集最後一週糞便。分析項目包括血清總膽固醇、三酸甘油酯、磷酯質、肝臟總脂質及膽固醇、糞便中酸性、中性固醇。結果顯示實驗前後各組老鼠體重增加及不同飼料間並無差異。在消化率方面,米膳食纖維對老鼠醣類消化率沒有影響($p>0.05$),但會減少蛋白質及脂肪消化率。血清分析白米加膽固醇組比玉米加膽固醇組有較低的血清膽固醇濃度,在不含膽固醇的兩組老鼠間則無此反應。食用糙米、米麩、燕麥三組含纖維飼料的老鼠雖比玉米膽固醇組有較低膽固醇濃度,但和白米加膽固醇組比較,並無顯著差異唯一的差異是食用含膳食纖維飼料的三組老鼠血清中低密度酯蛋白濃度有減少趨勢。在肝臟總酯質及膽固醇方面,玉米加膽固醇組最高,米麩、燕麥、糙米三組次之,白米加膽固醇組再次之,白米組及對照組最低。糞便分析顯示,食用含有膳食纖維飼料的三組老鼠,糞便中酸性固醇含量較高。但中性固醇含量則和各組老鼠肝中膽固醇含量成正比。由本實驗結果顯示,食用白米比食用玉米澱粉的老鼠有較低的血脂及肝臟脂質濃度。此效應在含高膽固醇的飼料中尤較顯著,且肝臟比血清更明顯。膳食纖維的添加雖無降低血脂作用,但減少低密度脂蛋白膽固醇濃度,使老鼠組織中膽固醇易輸送到肝中代謝,並顯示燕麥和糙米在降低血脂之效應類似。

• 英文摘要

The influence on lipid metabolism of rice carbohydrates and of total dietary rice' fiber was studied in rats. Male adult Wistar rats were

divided into seven groups: two groups had no added cholesterol, but included corn starch (C) (control group) and polished rice (P). The other five groups had 1% cholesterol added to their diets, including corn starch-with-cholesterol (CC), polished rice-with-cholesterol (PC), brown rice-with-cholesterol (BC) rice bran-with-cholesterol (RC) (adding 10% defatted rice bran) and oat-with-cholesterol (OC) the total dietary fiber levels for each were 1.2, 1.2, 2.9, 4.7, 9.4, respectively. All rats were sacrificed after four weeks of feeding; liver and arterial bloods were collected. The mean body weight was identical in each group and was consistent before and after the experiment. Serum total cholesterol was significantly ($p<0.05$) lower in PC than in CC, but there was no such effect in P and C. Although the groups including BC, RC and OC higher-fiber-containing showed lower serum total cholesterol than CC, there was no significant difference in comparison with PC. The only difference was that low-density lipoprotein cholesterol (LDL-C) in the fiber-containing groups was lower than PC. The highest liver lipid and liver cholesterol were observed in CC, then in PC, OC and BC, PC. P and C had the lowest values of TL and LC. The results also showed that rats with a polished rice diet had lower blood lipid levels and liver lipid levels than those with a corn starch diet. This effect was more significant in diets with adding cholesterol than those without such cholesterol. Liver lipids responded more than blood lipids. Although the increase in dietary fiber intake did not show the effect in lowering blood lipids, LDL-C was lower in these groups. These findings suggested that low LDL-C could facilitate liver catabolism of tissue cholesterol as well as lower the blood lipids when oat or brown rice diets were used.