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• 計畫中文名稱	米中澱粉及蛋白質對老鼠血、肝中膽固醇代謝 及膽酸排出之影響：米中難消化澱粉及穀蛋白 質
• 計畫英文名稱	The Starch and Protein of Polished Rice and with or without Exogenous Cholesterol Influence on Lipid Metabolism in Rats.
• 主管機關	行政院國家科學委員會
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• 研究人員	鄭心嫻 Cheng, Hsing-H
• 中文關鍵字	膳食纖維；膽固醇；蛋白質；難消化澱粉；膽汁酸；營養吸收
• 英文關鍵字	Dietary fiber；Cholesterol；Protein；Resistant starch；Bile acid；Nutrient absorption
• 中文摘要	本研究目的係探討米蛋白質之營養價值及米蛋白質對大白鼠脂質代謝之影響。以 0.025M 氫氧化鈉萃取出米蛋白質,再經冷凍乾燥或熱乾燥,以此作爲蛋白質來源。將 54 隻重約 202 克的 Wistar 品系之雄性大白鼠隨機分爲六組:即依 AIN-76 飼料配方之不添加膽固醇的酪蛋白組,添加 1%膽固醇的其他五組,依次分別爲酪蛋白組(對照組),5%米蛋白組,5%冷凍乾燥米蛋白組,20%冷凍乾燥米蛋白組及 20%熱乾燥米蛋白組。實驗進行四週後,禁食、宰殺並取血液及肝臟,分析血清三酸甘油酯、總膽固醇、高密度脂蛋白膽固醇和低密度脂蛋白膽固醇,肝臟之三酸甘油酯和總膽固醇,及糞便之總中性固醇和總膽酸的含量,並分析實驗材料及飼料之蛋白質的胺基酸含量。結果顯示米蛋白質的胺基酸組成中,以麩胺酸的含量最高,而離胺酸爲第一限制胺基酸;5%及 20%米蛋白質之實驗組的蛋白質消化率均顯著高於酪蛋白組($p<0.05$)。膽固醇代謝有關的胺基酸方面:5%及 20%米蛋白質之實驗組的甘胺酸和半胱胺酸含量分別爲酪蛋白組的 1.5 及 3 倍,2.8 及 9 倍,而離胺酸與精胺酸的比值爲酪蛋白組的 0.6 及 0.2 倍。且 20%米蛋白質之實驗組有顯著降低血清低密度脂蛋白膽固醇及總膽固醇,減少肝臟總膽固醇含量及增加糞便總膽酸的排出($p<0.05$)的效應,尤其以 20%冷凍乾燥米蛋白質之實驗組的效果最顯著。
• 英文摘要	The purpose of this research was to investigate the nutritive value of rice protein and the effect of rice protein on lipid metabolism in rats. Rice protein was extracted with 0.025M sodium hydroxide, then freeze-dried or heat-dried and was used as the source of protein. Fifty-four male, 202g Wistar rats were randomly divided into six groups: casein group which accorded to AIN-76 diet formular without cholesterol; and other five groups with 1% cholesterol included casein group (control), 5% rice protein (polished rice) group, 5%

freeze-dried rice protein group, 20% freeze-dried rice protein group, and 20% heat-dried rice protein group. Rats were killed after four-week feeding, and artery blood and liver were collected. The analysis of serum triglycerides, total cholesterol, HDL-cholesterol and LDL-cholesterol, liver triglycerides and liver total cholesterol, fecal total neutral steroids and bile acids were conducted. Protein contents and amino acid compositions in the experimental ingredients and the test diets were determined. The results showed that the amount of glutamic acid is the highest and lysine is the first limiting amino acid in the amino acid compositions of rice protein. The protein digestibilities in 5% and 20% rice protein groups were significantly higher than that in casein group ($p<0.05$). About the relationship between amino acid and cholesterol metabolism, glycine and cysteine of 5% and 20% rice protein groups respectively were 1.5 and 3 folds, and 2.8 and 9 folds that of casein groups. However, the ratio lysine to arginine (Lys/Arg) were 0.6 and 0.2 folds that of casein group. On the other hand, the 20% rice protein groups significantly reduced serum LDL-cholesterol, total cholesterol, liver total cholesterol contents, and increased fecal bile acids content. Especially, the effects of 20% freeze-dried rice protein group were the significant.