• 計畫中文名稱	藉由強化鈣質的米飯或飲食介入學校營養午餐計畫		
• 計畫英文名稱	Involvement of School Lunch Dieting Plan through Calcium-Fortified Rice or Diets		
• 系統編號	PG9408-0588	• 研究性質	應用研究
• 計畫編號	DOH94-TD- F-113-065-(2)	• 研究方式	委託研究
• 主管機關	行政院衛生署	• 研究期間	9407 ~ 9506
• 執行機構	台北醫學大學保健營養學系		
• 年度	94 年	• 研究經費	700 千元
• 研究領域	公共衛生學, 食品科技		
• 研究人員	謝明哲,楊淑惠,簡怡雯,林士祥,胡雪萍,薛玉梅		
• 中文關鍵字	加鈣米；鈣補充劑；學童；營養午餐；生物利用率；；；		
• 英文關鍵字	fortified rice with calcium；calcium supplement；school children；school lunch；bioavailability；；；		
• 中文摘要	鈣是身體中最多的礦物質，有非常重要的生理功用。由國民營養健康狀況變遷調查鈣的攝取量結果沒有一個年齡層達到衛生署公告國人膳食營養素參考攝取量（daily reference intake）。尤其在 13-15 歲和 16-19 歲的年齡層，不管男、女生只達到建議攝取量的 55~58%和 62~65%。這是非常嚴重的攝取不足現象，因爲學童和青春期是骨質儲存的黃金時間。若不能有足夠鈣的攝取建造良好的骨質，就可能造成未來骨質疏鬆的危機。當骨骼再造過程中，鈣從骨骼移出比積存的量還多時，造成骨質開始減少，即爲「骨質疏鬆症」。骨質疏鬆症是僅次於心臟病、癌症及中風的第四大健康殺手。根據統計，65 歲以上的婦女約有 1/4 罹患骨質疏鬆症。第二次國民營養健康狀況變遷調查指出，多數老年人口的骨質密度有低下情況。學童期鈣質的積蓄量與鈣質的吸收率爲生命週期的尖峰時間。青春期，體格迅速發育，鈣質積蓄量多，藉由增加飲食鈣攝取量，以增加最高骨密度（peak bone mass），可以減少老年期因爲骨質疏鬆而造成的骨折發生率。 如何藉由飲食增加鈣質的攝取應該是當務之急，因爲我們是米飯爲主的國家，研究擬找出合適的鈣補充劑型態可以添加在米飯或食物中，或混入其它食物或醬料的利用達到增加國人鈣攝取量。並評估其可能的安全量和實際效益。 研究擬分成 3 階段，第一階段由文獻整理的過程了解何種鈣化合物的種類、利用率和吸收率。並利用「官能品評」學理尋找在添加入米飯或食物中最不破壞其口感和外觀的鈣化合物的添加方式。第二階段將根據第一階段結果嘗試這在不同的製備和烹調階段了解鈣化合物的添加過程與成品鈣質的殘留量－即實際人體攝取量，藉由鈣攝取量、血鈣值和尿鈣值檢測，得到生物利用率。尋找適當的相關技術與評估技術性在小量和大量製備的可行性。第三階段藉助國民營養調查結果，了解國人的一般飲食鈣的最高攝取量尋找添加劑量的安全性，尤其是國小和國中階段的學童，使添加		

	量和一般攝取量總和不要超過上限攝取量（tolerable upper intake levels, UL）。計算鈣化合物添加於米飯或餐食中的實際效益。第四階段擬定可行的鈣化合物添加方式試行於學童營養午餐。 研究預期目標爲：1、研發添加鈣化合物於米飯等食物中；2、技術性加鈣食品（含米飯等）之鈣化合物添加種類與生物利用率；3、鈣化合物添加的安全量和實際效益（cost-effect）；4、試行於學童營養午餐，觀查學童經過鈣化合物加強飲食鈣量後，對其攝取量和飲食行爲或生活習慣影響。
• 英文摘要	Calcium owns the distinction of being the most abundant mineral in the body. and it play an important role of physiology function. ? CThe DOH ? ? s large-scale nationwide nutrition and health survey, the intake of calcium revealed the lack of calcium daily reference intake in all age groups. Particularly at group age 13~15 and 16~19, only 55~58 ? H and 62~65 ? H. This is a very serious problem because at school children and adolescent period, which is the golden stage of bony storage. If children could not intake enough calcium to establish good bony structure, it will cause the early loss at bony structure, which is ? §osteoporosis ? ? . Osteoporosis is the forth health killer, only weight behind cancer, heart disease and stroke. According to biostatistics data, there is about quarter of female having osteoporosis disease over 65 years old. In the second nationwide nutrition and health survey revealed that most elder population has lower density of bony structure. The peak stage of storage and absorption of calcium is school children period. The adolescent period is the second time period of fast body growth. By increasing intake of calcium, body can store a lots of calcium to increase the peak bone mass and also can decrease the incidence of bone fracture due to osteoporosis at elder age. To increase calcium intake by food is an effective way. Due to we are a rice eater country, to fortified calcium into rice or other food is a worth-to-try way. Certainly, safety and cost- benefit effect should be evaluated. This study is going to divided to 4 stages, the first stage is trying to find out the best calcium supplement by reviewed articles and to try the different portion of calcium and rice and to find out the best portion. The second stage is studying the calcium loss during the food preparation process. To evaluate the calcium intake and blood calcium, urine calcium, get the calcium bioavailability. The third stage is using the method of dietary record and analysis the total calcium intake quantity. Must be careful in calcium tolerable upper intake levels. The forth stage is conducted the best calcium-rice product in school lunch program. The purposes of study are as following: 1. to find out a best calcium-rice product, 2.to get the calcium-rice product bioavailability, 3.to evaluate the safety and cost-benefit effect of calcium-rice product, 4. to be supplyed the calcium-rice product.in the school lunch program.