Competition, Friendship and Animosity among Nutrients - Protein and Calcium: Friends or Foe?

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Albert Einstein once said, "Things should be made as simple as possible, but no simpler." When it comes to nutrients, most of us think of them too simplistically. For example, vitamin A is good for eye sight; calcium is essential for bones, and so on. But, just like people, nutrients also have relationships, and with relationships come compatibility, but also, competition, conflict and a whole host of other interactive issues. For example, selenium and vitamin E work as a team; iron seems to have some “co-dependency” issues involving copper and vitamin C; zinc and copper are staunch competitors in the intestine and fight for the same absorptive sites.

But what about protein and calcium? Are they friend or foe? A dialogue within the nutrition community is that protein and calcium are not exactly friends because protein causes acid production and the body fights the acid by using calcium from our bones which is then lost in the urine. We tested this idea in 15 postmenopausal women living in our community and found that calcium loss was identical if the women ate a low protein (10% of calories; 1.5 oz of meat) or a high protein diet (20% of calories; 10.5 ounces of meat). The amount of calcium in the diets mimicked what postmenopausal women eat in the U.S., which is about 600 mg/day. So, we have concluded that when protein intake is as high as 20% of calories and calcium intake is low, these two nutrients seem to get along fine and the conjecture about their conflict may be, well just that - conjecture.

But it is not as simple as that! Recent evidence from a calcium supplementation trial by another USDA Human Nutrition Research Center suggests that protein and calcium may even work as a team to build bone only if the intakes of both are high. We have decided to test this idea under carefully controlled conditions of a feeding study. Thirteen women have volunteered to eat diets which are either typical or high in calcium (600 or 1500 mg per day) and will eat two diets which are low or high in protein for 7 weeks each to help us define the relationship between calcium and protein. Another group of postmenopausal women are currently being recruited to begin similar diets in January 2004. So, if you have always wanted to simplify your life by having somebody else to do the cooking and the dishes AND be paid for eating good food, here is your chance!

If we find that combined high intakes of protein and calcium, the main building blocks of bone, help women retain more calcium, we would be one step closer to finding dietary means of preventing the complex disease of osteoporosis—the debilitating disease that afflicts as many as one in five postmenopausal women and is responsible for 300,000 hip and 700,000 spinal fractures per year, not to mention the $14 billion price tag!