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Calcium in Women's Diets

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The Winter 1986 (NFR-32) issue of the National Food Review included "Closeup on Calcium" in the food supply. The following article provides another look at that topic, focusing on the amount of calcium in the diets of women—the group that often falls short of recommended levels of calcium.

For many years we've heard of calcium's role in building strong bones in children. More recently, however, evidence has indicated that too little calcium is one factor associated with osteoporosis, a bone disorder characterized by decreased bone mass and increased susceptibility to fractures—occurring more frequently in women. A 1985 USDA food consumption survey reveals that the average amount of calcium in the diets of American women 35-50 years old is less than 80 percent of the current Recommended Dietary Allowances (RDA's).

What's more, in 1984 the National Institutes of Health Consensus Conference on osteoporosis concluded that the current RDA of 800 milligrams (mg) of calcium for women is too low. Although dietary calcium is only one of the factors associated with the development of osteoporosis in post-menopausal women, the conference panel recommended increasing the level to 1,000 to 1,500 mg per day as a preventive measure, beginning well before menopause.

In light of heightened concern about calcium, researchers at USDA's Human Nutrition Information Service (HNIS) recently looked at how much calcium women take in and from what foods they receive it. The data were taken from the 1985 Continuing Survey of Food Intakes by Individuals (CSFII) (see sidebar box) and were compared with the same information from the 1977-78 Nationwide Food Consumption Survey (NFCS).

Calcium Intake Up, But Varies Among Groups of Women

As the first step in assessing the amounts of dietary calcium, HNIS researchers compared women's diets in 1985 and 1977. In general, women in 1985 reported diets that were about 5 percent higher in food energy (calories) than they did in 1977. Similarly, the diets of the 1985 respondents were as high or higher in vitamins and minerals. However, interviewers for the 1985 survey asked more questions to ensure respondents included often-forgotten foods, and this increased probing may account for some of the rise in calories and nutrients.

The average calcium intake of women was significantly higher in 1985 than in 1977 (table 1). For women 19 to 34 years old, it rose 12 percent to 685 mg per day. Women 35 to 50 reported an increase of almost 18 percent to 606 mg per day. Despite the gains, however, the 1985 average amount of calcium in the diets of women 19 to 34 was only 81 percent of the RDA and only 75 percent of the RDA for the older group. In both survey years, women 19 to 34 reported diets significantly higher in calcium than those 35 to 50 years old.

Between 1977 and 1985, the average amount of dietary calcium increased significantly for white women, women living in the Midwest or South, in the central city or suburban areas, and at middle and high in-

comes (table 2). In both years, the average amount of calcium in the diets of black women was significantly lower than that of white women or those of other races.

In 1985, low-income women reported diets significantly lower in calcium than women with middle or high incomes. Among middle- and high-income women, dietary calcium was significantly higher in 1985 than in 1977. No significant increase was noted for the low-income women. High-income women averaged 688 mg daily in 1985, versus 549 for those in the low-income group. In contrast, average daily consumption for the three income classes only ranged between 548 and 581 mg in 1977.

In the 1985 survey, all women were asked about their employment status, education, and number of children ages 1 to 5 they had at home. (Only a subsample of women was asked these questions in 1977). Sixty percent of the women in the 1985 survey were employed either full- or part-time, but their calcium intakes didn't differ significantly from those not working. About 41 percent of the women in the 1985 survey had at least some college, while 59 percent had a high school education or less. On average, women with a college background had significantly more calcium in their diets than the others. Approximately 27 percent of the women had at least one child 1 to 5 years old at home. These women had sig-

Table 1. Calcium in Women's Diets Rises from 1977 to 1985

Age	1977	1985	1977	1985	1977	1985
	mg/day		mg/1,000 Kcal		Percent of RDA	
Women						
19 to 34	611	685 ¹	389	402	74	81 ¹
35 to 50	515	606 ¹	352	392 ¹	64	75 ¹
All	570	651 ¹	374	398 ¹	69	78 ¹

¹Statistically significant increase from 1977 to 1985.

Source: U.S. Department of Agriculture's 1977-78 Nationwide Food Consumption Survey and 1985 Continuing Survey of Food Intake by Individuals.

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Table 2. Amount of Dietary Calcium Varies Among Women

	1977	1985
	mg/day	
Race		
White	588	678 ¹
Black	471	487
Other	486	549
Region		
Northeast	603	633
Midwest	581	730 ¹
South	491	576 ¹
West	636	702
Income		
Low ²	548	549
Middle ²	583	667 ¹
High ²	581	688 ¹
Urbanization		
Central city	591	684 ¹
Suburban	573	653 ¹
Nonmetropolitan	547	598
Employment ³		
Employed (full- or part-time)	NA	659
Not employed	NA	640
Education ³		
High school or less	NA	606 ⁴
Some college	NA	716
Child 1-5 years at home ³		
None present	NA	630 ⁴
At least one	NA	706

¹Statistically significant increase from 1977 to 1985.

²Low income is below 131 percent of the poverty level; middle, 131 to 300 percent; high, over 300 percent. In 1977, the poverty level for a family of four was \$5,850, versus \$10,650 in 1985. ³Comparable data were not available for these characteristics in 1977. ⁴Statistically significant difference between groups.

Source: U.S. Department of Agriculture's 1977-78 Nationwide Food Consumption Survey and 1985 Continuing Survey of Food Intake by Individuals.

nificantly more calcium in their diets than those with no children this age.

While the amount of calcium in the diet varies by income, education, and race, these characteristics are not necessarily the causes. Diet is affected by many factors, some of which are difficult to measure, such as food preferences and attitudes towards food and health.

Beyond total daily calcium intake, it is also important to look at the amount obtained per 1,000 calories, technically termed calcium density. The more calcium per 1,000 calories in the diet, the more calcium dense it becomes. For example, a diet containing several foods, such as lowfat dairy products or green leafy vegetables that are calcium rich yet low in calories, is likely to be calcium dense. Overall, the calcium density of women's diets was significantly higher in 1985 than in 1977, suggesting that women ate more foods that are good sources of calcium and relatively low in calories.

Dairy Products: Major Providers of Calcium

Calcium can come from many foods, but milk and milk products were the major contributors to women's calcium intake in 1985, providing about 36 percent (*figure 1*), compared with 39 percent in 1977. Fluid milk, including whole, lowfat, and skim, contributed about 19 percent in 1985. The food group contributing the next largest share of calcium was grain products, including breads and other baked goods, cereals, pastas, and grain mixtures such as macaroni and cheese and pizza. These foods accounted for 26 percent of total calcium in women's diets.

In the one-day recall, fewer women reported using fluid milk in 1985 than in 1977. However, there was no significant difference in the average amount consumed, suggesting that those who drank milk increased their share. Women's consumption of whole milk was significantly lower in 1985 than in 1977, while skim and lowfat milk was significantly higher (*table 3*).

About the Data Sources...

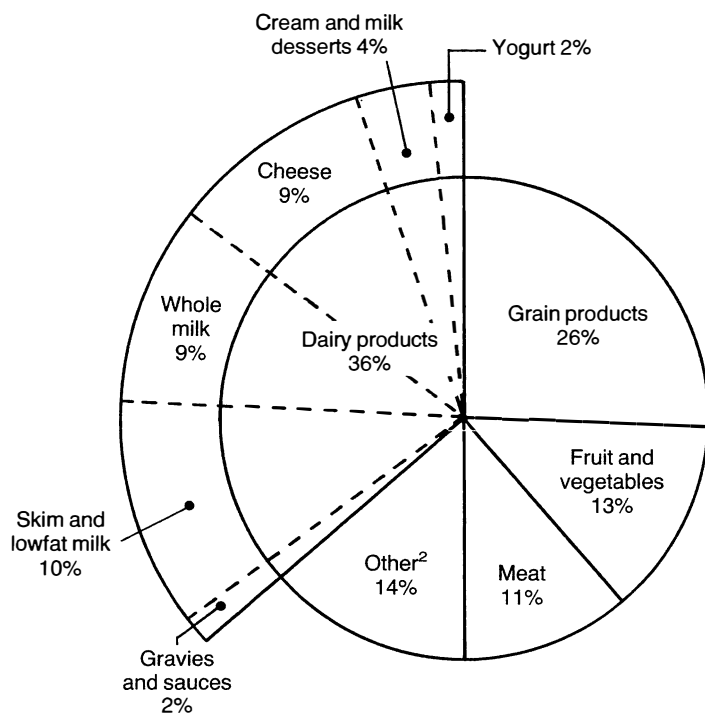
The results reported in this article were drawn mainly from two USDA food consumption surveys. In the 1977-78 Nationwide Food Consumption Survey, 36,000 people reported what they ate for 3 consecutive days. The survey asked a wide variety of questions regarding what was eaten, how much, and the source of the food, as well as a number of characteristics about the individuals and their households.

USDA's HNIS researchers used the data from the first of these 3 days in the 1977 survey (involving 2,228 women 19 to 50 years of age) and compared them with the first 1-day recall from the HNIS Continuing Survey of Food Intakes by Individuals. The 1985

survey includes six 1-day dietary recalls by 1,503 women and their children, if any, between 1 and 5 years. Survey data were collected over a year.

Data from the first 1-day recall for 1985 have been published in the *Nationwide Food Consumption Survey: Continuing Survey of Food Intakes by Individuals, Women 19 to 50 Years and Their Children, 1 to 5 Years, 1 Day*. The report is available from the U.S. Government Printing Office, Washington, D.C. 20402. The stock number is 001-000-04458-3, and the price is \$4.50. Make checks or money orders payable to the Superintendent of Documents. For faster service, call the GPO order desk at (202) 783-3238.

Figure 1. Dairy Products Provided the Largest Share of Women's Calcium in 1985¹



¹Women 19 to 50 years old. ²Includes eggs, nuts, seeds, legumes, fats and oils, sugars and sweeteners, and alcoholic and nonalcoholic beverages. Source: CSFII-85, HNIS, USDA.

Table 3. Women's Consumption of Dairy Products

	Intake		Women using	
	1977	1985	1977	1985
	Grams per day		Percent	
Total fluid milk	148	141	54.9	51.4
Whole	98	64 ¹	39.0	26.0
Lowfat/skim	48	77 ¹	16.1	26.1
Yogurt	6	8	2.9	4.5
Cheese	17	18	27.5	33.9
Cream and milk desserts	19	24 ¹	20.0	25.0

¹Statistically significant difference from 1977 to 1985.

Source: U.S. Department of Agriculture's 1977-78 Nationwide Food Consumption Survey and 1985 Continuing Survey of Food Intake by Individuals.

Some recent studies have shown that women getting a lot of calcium obtain a greater percentage of it from dairy products than women with low calcium intakes. An HNIS study using NCHS 1977-78 data revealed that women consuming 800 mg or more of calcium obtained more than 60 percent from milk and milk products. Women getting less than 560 mg obtained only 30 percent of their calcium from dairy products. Results of a Pennsylvania State University study using the 1977 data showed that, for over three-quarters of those surveyed, whenever two or more foods from the milk group were reported in one day, the calcium intake was at least 80 percent of the RDA.

Many women who want to increase their consumption of milk and milk products to meet calcium needs may be concerned about the fat content of some of these foods. In 1985, the milk and milk products group contributed about 11 percent of women's total calories and about 14 percent of their fat intake. Most of the fat from this group comes from cheese, cream, and milk desserts. Skim and lowfat milk, considered rich in calcium yet low in calories, overall provided 10 percent of women's total calcium and only 2 percent of the total fat in their diets. Switching from whole to lowfat milk products as a way to avoid too much fat in the diet is one of the tips suggested in the Dietary Guidelines for Americans, issued by the Departments of Agriculture and Health and Human Services (HHS).

Milk is an important source of calcium. However, only about half of all women reported using fluid milk in the 1985 survey. The overall average daily intake was 141 grams or about half a cup. About 20 percent reported avoiding whole milk only, while 7 percent indicated they avoided all milk.

As might be expected, women avoiding milk of all kinds had a significantly lower average calcium intake than those who didn't. However, the average amount of calcium in the diets of women who said they only avoided whole milk was significantly higher than those not avoiding whole milk. Women who avoided whole milk likely chose to drink skim or lowfat instead, and in large enough amounts to significantly increase the calcium in their diets.

For women who do not drink milk regularly, alternate sources of calcium become increasingly important. These include products made from milk, such as yogurt and cheese; dark green leafy vegetables, such as kale, spinach, and collards; and fish with edible bones, such as salmon and sardines.

Beverage Choices and Other Dietary Trends

With milk consumption down, what other beverages are American women drinking? For a starter, the average daily intake of carbonated soft drinks rose from 6 fluid ounces in 1977 to about 10 fluid ounces in 1985. Over half of the women surveyed in 1985 drank carbonated soft drinks. Women's consumption of both regular and low-calorie soft drinks rose significantly. In fact, consumption of low-calorie soft drinks doubled between 1977 and 1985.

In 1985, 15 percent of the women surveyed reported using alcoholic beverages, compared with 12 percent in 1977. Women reported drinking significantly more alcoholic beverages in the one-day recall in 1985 than in 1977—84 grams a day in 1985 (about 3 fluid ounces), compared with 55 grams (about 2 fluid ounces) in 1977. Trends in alcohol use, however, are

difficult to interpret from a survey of this type for several reasons, including possible intentional underreporting.

Over half of the women surveyed in 1985 reported drinking coffee and one-third, tea. The average amount of each consumed by all women did not change significantly from 1977 to 1985.

Approximately 13 percent of the 1985 respondents reported that they were currently on a special diet, the majority of these being low-calorie diets. Women on a special diet had significantly less calcium in their diets than other women. However, the calcium density of their diets was significantly higher than those not on special diets, suggesting those on diets included more calcium-dense foods in their meals. In 1985, 4 percent of the women reported they were vegetarians; the average amount of calcium in the vegetarians' diets did not differ significantly from other women. But here again, their calcium density was above that of nonvegetarians.

The percentage of women who reported using vitamin and mineral supplements increased from 39 percent in 1977 to 58 percent in 1985. Interestingly, in both years, supplement users got more calcium from food than the nonusers. These findings were similar to those found in the recent HHS National Health and Nutrition Examination Survey II. Since it is difficult to collect accurate figures on the quantity and dose of supplements taken, the amount of calcium provided by them is usually not reported. However, a 1980 Food and Drug Administration survey revealed that women between 25 and 64 years who used supplements got an average of 24 percent of their RDA for calcium from them. □

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