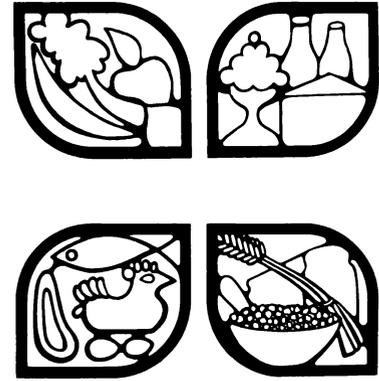


CALCIUM

Prepared by

Jo Anne Barton, Extension Specialist, Foods and Nutrition



The body contains more calcium than any other mineral. Two to three pounds of the adult's weight is calcium. Most of the calcium (99%) is in the bones and teeth, with the remainder in the fluids and soft tissues.

Calcium serves two important functions in the body — the building of bones and teeth and the regulation of certain body processes.

Calcium in combination with phosphorus gives rigidity and strength to bones and teeth. Skeletal bone provides the structure to which muscle tissue is attached. The rib cage and skull provide protective cavities for the heart, lungs, and brain.

Normal behavior of heart, muscles, nerves, and the blood clotting process all depend on the presence of calcium in tissues and blood.

The need for calcium is greatest during periods of rapid growth but the need does not stop when growth stops. Bone is constantly being formed and resorbed. It has been estimated that about 700 mg of calcium enter and leave the bones of an adult man each day.

Ingested calcium is not completely absorbed. It has been found that some individuals absorb only 20% of the calcium ingested. There are several factors which influence absorption. The need for calcium and the usual level of intake are two of the factors. Individuals seem to adjust to varying levels of intake over a period of time. In other words, if the intake is consistently low, a greater amount of the calcium in the food will be absorbed. If the intake is consistently greater than the need, a smaller proportion of the calcium will be utilized.

Calcium utilization is more efficient in periods of growth when calcium is needed to increase the volume of bone and to strengthen bone already formed.

The intake of other nutrients also influences calcium absorption. Vitamin D improves the efficiency of calcium absorption particularly during periods of rapid growth or illness. Vitamin D is often added to milk, our chief dietary source of calcium.

Changes in protein intake also affect calcium utilization. As protein intake increases, calcium utilization decreases. It has been suggested that a high protein intake coupled with a marginal intake of calcium — a fairly typical dietary pattern in the United States — may be a factor in the development of osteoporosis. More study is needed to clarify the relationship between dietary intakes of calcium and protein. At present, it would appear that persons consuming a diet high in protein should be sure that calcium intakes are adequate.

Phosphorus is also needed for bone formation. An imbalance between these two minerals can contribute to an imbalance in body calcium. If there is too little calcium in relation to the phosphorus in the diet, calcium may be withdrawn from the bones for use in vital body functions.

Oxalic acid in cocoa and certain vegetables (beet greens, chard, rhubarb, and spinach) and phytic acid found in the outer coats or bran of cereals and in legumes combine with calcium to make the calcium unavailable. This does not present a problem unless calcium intake is quite limited. Persons who consume large quantities of whole grains while limiting calcium sources may have an inadequate calcium intake.

CALCIUM NEEDS

The Food and Nutrition Board, National Academy of Sciences — National Research Council, has established Recommended Dietary Allowances for calcium. The Recommended Dietary Allowances are the levels of intake considered to be adequate to meet the known nutritional needs of almost every healthy person. The Board in establishing the allowances for calcium acknowledged that many adults do remain in calcium balance with daily intakes of less than 800 mg. The 800 mg level is a guide for planning and evaluating the adequacy of food supplies.

Age yrs.	mg
0.0 - 0.5	360
0.5 - 1.0	540
1 - 3	800
4 - 6	800
7 - 10	800
11 - 14	1200
15 - 18	1200
19 - 22	800
23 - 50	800
51+	800

Additional dietary calcium is needed during pregnancy and lactation — the Recommended Dietary Allowance being 1200 mg.

CALCIUM SOURCES

Milk and cheese are the richest sources of calcium among common foods. These foods along with other foods made from milk comprise the Milk and Milk Products Group of the Daily Food Guide. This group — one of four in the Guide — furnishes important amounts of protein and riboflavin as well.

Breads and cereal products and some vegetables supply small amounts of calcium but it is difficult to get sufficient calcium if no dairy products are consumed.

Some persons are not able to tolerate milk because they lack the ability to break down lactose, a form of sugar found in milk. This condition is rare in infants but is more apt to be present in adults. Both the Protein Advisory Group of the United Nations and the Food and Nutrition Board feel that the evidence of the positive contributions of milk outweigh the fear of its tolerance. Persons with a mild lactose deficiency can often tolerate milk products such as cheese and yogurt.

Calcium supplements may be used when milk cannot be tolerated.

One cup of milk provides 285 mg of calcium. The table below shows the approximate calcium content of a number of foods as well as the protein and kilocalorie content.

The suggested number of servings of foods from the Milk and Milk Products Group is related to calcium needs. Persons in age groups for whom 800 mg of calcium is recommended should have 2 to 3 cups of milk a day or the equivalent. Teenagers and pregnant and nursing women need 4 or more servings from the Milk Group to supply calcium needs.

Food	Serving size	Calcium content mg	Protein content g	Kilocalorie content
Evaporated milk, diluted	1 cup	320	9	175
Buttermilk	1 cup	295	9	90
Skim milk, fresh or reconstituted	1 cup	295	9	90
Whole milk	1 cup	290	9	160
Swiss cheese	1 oz.	260	8	105
Cottage cheese, creamed	1/2 cup	115	16	130
Cream cheese	2 Tbsp.	15	2	105
Cheddar cheese	1 oz.	215	7	115
Pasteurized processed cheese	1 oz.	200	7	105
Sour cream	1 Tbsp.	10	-	25
Cocoa made w/milk	1 cup	295	10	245
Ice cream	1/2 cup	95	3	125
Ice milk	1/2 cup	100	3	100
Sherbet	1/2 cup	15	1	130
Yogurt, skimmed milk	1 cup	295	8	125
Butter	1 Tbsp.	5	-	100
Broccoli	1 stalk	160	6	45
Collard greens	1/2 cup	145	2	45
Spinach	1/2 cup	135	2	20
Bread, white enriched	1 slice	20	2	70
Biscuit	1 biscuit	35	2	105
Corn muffin, enriched flour and cornmeal	1 muffin	40	3	125

Issued in furtherance of Cooperative Extension work, Acts of May 8 and June 30, 1914, in cooperation with the U.S. Department of Agriculture. W. R. Van Dresser, Dean, Extension Division, Cooperative Extension Service, Virginia Polytechnic Institute and State University, Blacksburg, Virginia 24061.

The Virginia Cooperative Extension Service by law and purpose is dedicated to serve all people on an equal and nondiscriminatory basis.

An Equal Opportunity/Affirmative Action Employer

NUTRITION LABELING

Many food products now bear a nutrition information panel. Such label information is required on products to which one or more nutrients is added and/or for which nutrition claims are made. All food manufacturers and processors may choose to include a nutrition information panel. A standard format has been established for presentation of information about 10 nutrients.

Standards for nutrition labeling have been established for four broad age categories: (1) infants, (2) children 1 to 4 years of age, (3) pregnant and lactating women, and (4) the rest of the population. The latter standard is the one used most frequently. Standards for labeling purposes are identified as the U.S. RDA and are based on the 1968 edition of the Recommended Dietary Allowances.

Several sex-age groups were combined in establishing the U.S. RDA so they cannot be expected to fit all persons.

U.S. RDA's for CALCIUM	
Infants	600 mg
Children, 1 - 4 yrs.	800 mg
Pregnant and lactating women	1300 mg
Adults and children over 4 yrs.	1000 mg

The quantity of calcium in a serving of the food is stated as the percentage of the U.S. RDA supplied. A 1-cup serving of fresh, whole milk supplies 285 mg of calcium or 25 percent of the U.S. RDA for adults and children over 4.