

LOVE YOUR BONES

CALCIUM & PROTEIN FACT SHEET

A calcium and protein-rich diet combined with vitamin D is essential to improve bone and muscle health at all ages. Together with physical activity, these nutrients are important pillars of osteoporosis prevention.

CALCIUM

- Calcium performs various functions in the body and is needed for muscle contraction and as a building block of bone.
- Our skeleton houses 99% of our body's calcium stores. Calcium built into bone acts as a reservoir for maintaining calcium levels in the blood.
- Individuals who have more vitamin D are able to absorb more calcium.
- A calcium-rich diet is especially important in order to build bone during the highest rate of bone growth - in childhood and adolescence.
- In adulthood, when bone density is decreasing, a calcium-rich diet helps us to maintain bone mineral density.
- In combination with adequate vitamin D, calcium levels of about 800 mg per day (sufficient for most healthy adults) can be achieved by a healthy diet that includes daily intake of calcium rich foods.
- Foods which are highest in calcium include all dairy products (milk, yoghurt, cheese), fish and nuts.
- Dietary sources of calcium are generally preferred to supplements for several reasons:
 1. calcium-rich foods such as dairy products and nuts contain additional nutrients valuable for bone and muscle health, especially high-quality protein.
 2. high-dose calcium supplementation (1000 mg and more) may not be beneficial for cardiovascular health.
 3. calcium tablets can reduce phosphate absorption in the intestine. This is a concern in the senior population, where phosphate deficiency is found in about 10 to 15% of women over 60 years of age. Conversely, dairy products provide calcium and phosphate.
- The focus in fracture prevention has shifted to vitamin D supplementation in combination with a healthy calcium-rich diet.

PROTEIN

Protein is a building block for strong bones and muscles. Low protein intake is detrimental to bone development in youth as well as to bone mass maintenance later in life. Some facts:

- As with vitamin D, protein has a dual benefit on osteoporosis prevention as it helps build stronger bones and muscles.
- Low protein intake is associated with a reduction of muscle mass throughout the life cycle.
- In children, a higher protein intake has been shown to increase the benefit of exercise on bone mineral content.
- Seniors with decreased protein intake are more vulnerable to muscle weakness, sarcopenia (age-related decline in muscle mass and function) and frailty, all contributing to an increased risk of falling.
- Several clinical trials with protein supplementation in senior hip fracture patients resulted in fewer deaths, shorter hospital stay, and a higher likelihood of return to independent living.
- Increasing protein intake has a beneficial effect on bone mineral density in seniors taking vitamin D plus calcium supplements, suggesting an added benefit of these nutrients.
- The hypothesis that animal proteins, by increasing the acid load in our body, lead to bone loss has been disproved.
- Both plant and animal protein sources appear to promote stronger bones and muscles for osteoporosis prevention.
- Foods that are high in protein include meat, fish and poultry, dairy products, nuts, eggs, tofu, kidney beans and lentils.

References are provided in the IOF publication "Three Steps to Unbreakable Bones – Vitamin D, Calcium and Exercise" (2011) – available on www.iofbonehealth.org

IOM* DIETARY REFERENCE INTAKES FOR CALCIUM

Life Stage Group	Calcium	
	Estimated Average Requirement (mg/day)	Recommended Dietary Allowance (mg/day)
Infants** 0 to 12 months	-	-
1-3 years old	500	700
4-8 years old	800	1,000
9-18 years old	1,100	1,300
19-50 years old	800	1,000
51-70 year old males	800	1,000
51-70 year old females	1,000	1,200
>70 years old	1,000	1,200
14-18 years old, pregnant/lactating	1,100	1,300
19-50 years old, pregnant/lactating	800	1,000

* Institute of Medicine of the National Academies in the USA

**For infants, Adequate Intake is 200 mg/day for 0 to 6 months of age and 260 mg/day for 6 to 12 months of age.

embrace calcium rich foods