

# 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](http://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