AIS SPORTS SUPPLEMENT FRAMEWORK

CALCIUM GROUP A

Calcium is the most abundant mineral in our diets. Most calcium in the body is found in bones and teeth (99%), where it provides both a structural and functional role. The remaining calcium is used for metabolic functions such as muscle contraction (including maintaining a regular heartbeat), blood pressure regulation, blood clotting, plus water and hormone balance. For these functions to be maintained optimally long term, dietary calcium needs to be sufficient so that calcium stored in the bones is not utilised. Calcium plays an important role in short- and long-term bone health.

Optimal bone health requires weight bearing exercise, hormonal balance, adequate fuel, calcium and vitamin D.

Inadequate calcium intake during adolescence and up until 25 - 30 years of age may lead to sub-optimal bone health and increased fracture risk due to poor bone strength.

Despite its hard structure, bone is dynamic and constantly being broken down and rebuilt.

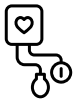
Calcium supplements are typically provided in the form of calcium carbonate, although calcium citrate, phosphate and gluconate are also available. The amount of calcium provided by supplements will vary, but is compared via calcium equivalents.

BENEFITS AND SITUATIONS FOR USE

BONE HEALTH

NERVE HEALTH

MUSCLE CONTRACTION



BLOOD PRESSURE REGULATION

> Athletes at risk of inadequate calcium intake and subsequent poor bone health include those with:

- ☑ Low calcium intakes or inadequate intake of dairy and/ or calcium fortified dairy alternatives.
- ☑ Vegetarian or vegan diet preferences with no, or limited, calcium fortified foods.
- ☑ Poor calcium balance due to undiagnosed/poorly managed gut health conditions which may impact calcium absorption.
- ☑ High intake of oxalates, commonly found in green leafy vegetables and legumes, that bind to dietary calcium, reducing calcium absorption from the gut.
- ☑ Inadequate fuelling, through excessive dietary restriction or under fuelling during periods of heavy training loads.
- ☑ Impaired menstrual function (e.g. failure to start menstruating, missing a period or menopause).

HOW MUCH CALCIUM SHOULD YOU AIM FOR?

> In the absence of specific guidelines for athletes, the calcium intake guidance for the Australian population remains appropriate. There is no evidence to suggest exercise increases calcium requirements, however calcium losses from sweat warrants further investigation.

> Some studies have suggested that the body may make up for acute calcium lost through sweat by taking calcium from bones. Consuming a pre-training snack rich in calcium may reduce this effect, potentially protecting bone health e.g. tub of yoghurt or a fruit smoothie made with milk.

Australian Recommended Dietary Intakes (RDI) for calcium

Age Group	Calcium (mg/day)	
	Male	Female
12–18 yrs	1300	1300
19–50 yrs	1000	1000
51–70 yrs	1000	1300
>70 yrs	1300	1300

(National Health and Medical Research Council, 2014)

☑

CALCIUM

FOOD FIRST

> Calcium sourced from food is preferred due to increased intake of other associated beneficial nutrients. Consideration of the need for calcium supplementation should only come after review of current dietary intake and attempts to increase dietary calcium intake.

> Two thirds of the calcium intake of a western diet comes from dairy products, with smaller amounts from bony fish, legumes, some nuts, and calcium fortified dairy alternative beverages and breakfast cereals.

> Aim for at least 3 serves of dairy foods or calcium fortified foods each day to ensure daily calcium needs are achieved.

Good sources of dietary calcium

Cheddar cheese
2 slices (~ 40 g)
= 400 mg

Yoghurt, natural
1 small tub (~200 g)
= 350 mg

Soy milk, fortified,
1 cup (250 mL)
= 295 mg

Salmon, canned
(with bones) 1 small
can (90 g) = 200 mg

Breakfast cereal,
fortified, 1 cup (~40 g)
= 150 - 200 mg

Eggs
2 large (~120 g)
= 75 mg

Almonds, skin on
20 almonds, (~25 g)
= 65 mg

Tofu, firm
1/2 cup (~125 g)
= 400 mg

Milk
1 cup (250 mL)
= 300 mg

Oat milk, fortified,
1 cup (250 mL)
= 290 mg

Bread, fortified
2 slices (~80 g)
= 180 mg

Milo
3 heaped tsp
= 150 mg

Baby spinach, cooked
1 cup, (~115 g)
= 70 mg*

Broccoli, steamed
1 cup (~155 g)
= 40 mg*

** High oxalate (5 - 60% absorbed)*

High calcium products

Oak Plus flavoured
milk (500 mL)
= 910 mg

John West protein+
calcium tuna (90 g tin)
= 840 mg

Rokeby Farms breakfast
smoothie
= 830 mg

The Complete Dairy
milk, 1 cup (250 mL)
= 430 mg

Vitasoy calci plus
soy milk, 1 cup (250 mL)
= 400 mg

Siggi's yoghurt pouch
(150 g)
= 400 mg

CONCERNS AND CONSIDERATIONS

Calcium supplementation alone does not guarantee bone health in the absence of: adequate fuelling, hormone balance, weight-bearing exercise and a healthy gut.

Disordered eating can markedly impair long term bone health.

Soy, oat and almond 'milks' are popular dairy alternatives. Unless fortified with calcium during manufacture, they contain no natural calcium and are low in protein. Choose diary foods where possible, or where necessary, calcium fortified dairy alternatives.

More research is needed to understand the impact of higher dietary protein and sodium intakes on bone health. Population studies suggest higher protein intakes are actually associated with improved bone health.

Bone stress injuries can be the first sign of undiagnosed coeliac disease, particularly in those with no GI symptoms.

Vegetarian diets may reduce calcium absorption due to high oxalate and phytate content. Calcium intake should exceed RDI to compensate for this. Avoid calcium fortified foods and high oxalate or phytate foods at the same meal.

All supplements have a doping risk of some kind. Some supplements are riskier than others. Athletes should only use batch-tested supplements. The Sport Integrity Australia app provides a list of more than 400 batch-tested products. [www.sportintegrity.gov.au/what-we-do/supplements-sport].

While batch-tested products have the lowest risk of a product containing prohibited substances, they cannot offer you a guarantee. Before engaging in supplement use, you should refer to the specific supplement policies of your sport or institute and seek professional advice from an accredited sports dietitian (www.sportsdietitians.com.au). Athletes are reminded that they are responsible for all substances that enter their body under the 'strict liability' rules of the World Anti-Doping Code.