

Calcium Supplements

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Calcium requirements-Introduction

- Adequate calcium and vitamin D intake is necessary to maximize peak bone mass and to minimize both the risk of fractures in adolescence and the development of osteoporosis in adulthood
- **The peak bone mass** attained by approximately **age 30 years** is the mass from which skeletal loss occurs later in life
- **Genetic factors** influence skeletal structure and bone turnover and account for **40 to 80 %** of the differences in peak bone mass.
- Environmental factors are important during adolescence and are thought to account for **20 percent** of the variance in peak bone mass. Thus, factors such as adequate dietary calcium and increased weight-bearing activity during adolescence help to maximize peak bone mass

- The increase in calcium absorption during adolescence is thought to be mediated by calcitriol (1,25-dihydroxyvitamin D), which also increases in concentration during the pubertal growth.
- **Vitamin D** fortification of calcium-containing foods enhances intestinal absorption of calcium, whereas naturally occurring **oxalate** and **phytate** diminish it.
- **Vitamin A** and synthetic retinoids increase bone resorption, whereas statins can increase bone formation and decrease bone resorption.
- PTH reduces calcium excretion, an appropriate response if hypocalcemia has stimulated PTH secretion. On the other hand, renal excretion of calcium is increased by **dietary salt and protein**.
- Diuretics also affect calcium excretion, which is increased by **loop diuretics** and reduced by **thiazide diuretics**.

Calcium balance

- Data from balance studies suggest that for most healthy 9-18 year old children, a threshold effect exists, with the maximal net calcium balance being achieved at intakes between 1200 and 1500 mg/day
- Comparing calcium balance in girls who were on very low (400 mg/day) versus higher calcium intakes (1200 to 1300 mg/day) showed a small **adaptation** with **increased absorption** and **decreased excretion** in girls with low intakes, but this adaptation was not adequate to account for the large gap in intakes.
- Net calcium balance was much lower in the girls with low intakes. This suggests that **intakes <500 mg/day**, such as those of up to **20 percent** of the United States population, may lead to large calcium deficits

RECOMMENDED INTAKE

Age	Male	Female	Pregnant	Lactating
0–6 months*	200 mg	200 mg		
7–12 months*	260 mg	260 mg		
1–3 years	700 mg	700 mg		
4–8 years	1,000 mg	1,000 mg		
9–13 years	1,300 mg	1,300 mg		
14–18 years	1,300 mg	1,300 mg	1,300 mg	1,300 mg
19–50 years	1,000 mg	1,000 mg	1,000 mg	1,000 mg
51–70 years	1,000 mg	1,200 mg		
71+ years	1,200 mg	1,200 mg		

The upper tolerable limit for calcium was set at 3000 mg/day.

food	Milligrams (mg) per serving	Percent DV*
Yogurt, plain, low fat, 220 g	415	42
Mozzarella, part skim, 42 g	333	33
Sardines, canned in oil, with bones, 85 gr	325	33
Cheddar cheese, 42 g	307	31
Milk, nonfat, 1 glass	299	30
Milk, whole (3.25% milk fat),	276	28
Orange juice, calcium-fortified, 170 g	261	26
Salmon, pink, canned, solids with bone, 85 g	181	18
Turnip greens, fresh, boiled, ½ cup	99	10
Ice cream, vanilla, ½ cup	84	8
Bread, white, 1 slice	73	7
Bread, whole-wheat, 1 slice	30	3
Broccoli, raw, ½ cup	21	2
Cheese, cream, regular, 1 tablespoon	14	1



Selected food sources of vitamin D

Food	Amount per serving
	In international units (IU)
Cod liver oil, 1 tablespoon (15 mL)	1360
Salmon, cooked, (85 g)	380 to 570*
Tuna fish, canned in water, drained, 3 ounces (85 g)	40 to 68
Milk, nonfat, reduced fat, and whole, vitamin D-fortified, 240 ml	100
Orange juice fortified with vitamin D, (240 mL) (check product labels)	100
Yogurt, fortified with vitamin D, (180 mL) (fortified yogurts)	80
Margarine, fortified, 1 tablespoon (15 g)	60
Sardines, canned in oil, drained, 2 sardines	46
Liver, beef, cooked, 3.5 ounces (100 g)	46
Ready-to-eat cereal, fortified with vitamin D, (227 g) (heavily fortified cereals)	40
Egg, 1 whole (vitamin D is found in yolk)	25
Cheese, Swiss, (29 g)	6

- the total intake of calcium (diet plus supplements) should not routinely exceed **2000** mg/day, because of the possibility of adverse effects
- Calcium carbonate absorption is better when taken with meals; in comparison, calcium citrate is well absorbed in the fasting state and is equally absorbed compared with calcium carbonate taken with a meal.
- Calcium carbonate is also **poorly** absorbed in patients taking PPIs or H2 blockers. We (uptodate) usually recommend calcium citrate as a first-line calcium supplement in these patients
- Calcium supplementation in excess of 500 mg/day should be given in divided doses. Higher individual doses are associated with a plateau in calcium absorption that may prevent the attainment of positive calcium balance.
- **Side effects**
 - **Nephrolithiasis**
 - **Cardiovascular disease**
 - **dyspepsia and constipation.**
 - **calcium supplements interfere with the absorption of iron and thyroid hormone, and therefore, these medications should be taken at different times.**
 - **Excess calcium supplementation (as opposed to calcium obtained by nutritional means) in patients with eGFR<30 mL/minute may be associated with an increase in greater arterial calcification and CVD.**

Risk of calcium stones

- Kidney stones in the urinary tract are most commonly composed of **calcium oxalate**.
- In the Women's Health Initiative, postmenopausal women who consumed 1,000 mg of supplemental calcium and 400 IU of vitamin D per day for 7 years had a **17%** higher risk of kidney stones than subjects taking a placebo.
 - The Nurses' Health Study also showed a positive association between supplemental calcium intake and kidney stone formation.
- High intakes of *dietary* calcium, do not appear to cause kidney stones and may actually **protect** against developing them. Binding of dietary oxalate in the gut, leading to decreased oxalate absorption and excretion, may be responsible for this phenomenon
- For most individuals, other risk factors for kidney stones, such as **high intakes of oxalates from food** and **low intakes of fluid**, probably play a bigger role than calcium intake.

Cardiovascular disease

- The effect of calcium supplementation on risk of cardiovascular disease (CVD), particularly myocardial infarction (MI), is controversial.
- However, neither calcium supplements (up to 1000 mg daily), increased dietary intake of calcium, nor vitamin D supplements have been shown to increase all-cause or cardiovascular mortality, and in one meta-analysis of trials comparing vitamin D with or without calcium with no treatment or placebo, calcium plus vitamin D was associated with **reduced** all-cause mortality in older adults.
- The National Osteoporosis Foundation considers supplementation in this dose range safe from a cardiovascular viewpoint

Interactions with Medications

- Calcium can decrease absorption of the following drugs when taken together:
 - Bisphosphonates
 - Fluoroquinolone and tetracycline classes of antibiotics,
 - Levothyroxine,
 - Phenytoin
- Thiazide-type diuretics can interact with calcium carbonate and vitamin D supplements, increasing the risks of hypercalcemia.
- Both aluminum-magnesium-containing antacids increase urinary calcium excretion.
- Mineral oil and stimulant laxatives decrease calcium absorption.
- **Glucocorticoids** can cause disorder in calcium intestinal absorption (*onset 2-5 days duration days to weeks*) and eventually osteoporosis when they are used for months.

Calcium/vitamin D Supplement

- Women with inadequate dietary intake should take supplemental elemental calcium (generally 500 to 1000 mg/day), in divided doses at mealtime, such that their total calcium intake (diet plus supplements) approximates **1200** mg/day
- Women should also ingest a total of **800** IU of vitamin D daily. Higher doses are required if they have malabsorption or rapid metabolism of vitamin D due to concomitant anticonvulsant drug therapy.
- Most postmenopausal women with osteoporosis require vitamin D supplementation as it is difficult to achieve goals with diet alone
- **Isoflavones** – We do not recommend isoflavone supplements as a strategy to prevent or treat osteoporosis.
 - Isoflavones (a type of phytoestrogen) are micronutrient substances that have properties similar to estrogen. Two types of isoflavones, genistein and daidzein, are found in soybeans.
 - Ipriflavone is a synthetic isoflavone derivative and is widely available as an over-the-counter product in many countries.
- **Vitamin K** –Exogenous **vitamin K** is required for the carboxylation of osteocalcin, which in turn allows osteocalcin to bind to hydroxyapatite mineral.
 - We do not recommend routine vitamin K supplementation for the maintenance of skeletal health or the prevention of fractures in high-risk individuals.

Calcium salt	Elemental calcium content	
	mg Ca++ per gram	mEq Ca++ per gram
Calcium acetate	250	12.7
Calcium carbonate	400	20
Calcium chloride	270	13.5
Calcium citrate	211	10.6
Calcium glubionate	64	3.2
Calcium gluconate	90	4.5
Calcium lactate	130	6.5
Calcium phosphate, tribasic	390	19.3

Vitamin D

- Vitamin D is generally easier to absorb than calcium, and it may be taken as one dose with or without food. The two commonly available forms of vitamin D supplements are **ergocalciferol** (vitamin D2) and **cholecalciferol** (vitamin D3).
- Some [39,40], but not all [41], studies suggest that vitamin D3 increases serum 25(OH)D more efficiently than does vitamin D2
- **Calcitriol** is the most active metabolite of vitamin D. It can frequently cause hypercalcemia and/or hypercalciuria, necessitating close monitoring and adjustment of calcium intake and calcitriol dose. Therefore, calcitriol is not used for vitamin D supplementation in osteoporosis.
- Safe Upper Limit for vitamin D as 4000 international units per day
- Excessive vitamin D, especially combined with calcium supplementation, may cause hypercalcemia, hypercalciuria, and kidney stones.
- chronically high levels of 25(OH)D (exceeding 40 and 50 ng/mL [100 and 125 nmol/L], respectively) have been found in some association studies to be linked to a modest increase in risk of some **cancers** (eg, pancreatic), mortality, and **falls**. More studies are needed to define the upper level of serum 25(OH)D that is safe, not only in respect to the risk of kidney stones, but also for falls and chronic diseases

Food Supplement / مکمل غذایی

Supplement Facts / ترکیبات مکمل

Amount Per Serving		%RDA	مقدار سازنده مکمل غذایی به ازای ۱ قرص
Calcium Citrate Tetrahydrate	1000 mg	NA	سیترات کلسیم تترا هیدرات
Equivalent to elemental Calcium	210.77 mg		معادل کلسیم
Vitamin D3	200 IU	50	ویتامین D3
Magnesium Hydroxide			
Equivalent to elemental Magnesium	100 mg	28.57	منیزیم (به صورت هیدروکسید)
Zinc Sulphate Monohydrate			
Equivalent to elemental Zinc	5 mg	33.33	روی (به صورت سولفات مونو هیدرات)

%RDA=Recommended Daily Allowance, NA :Not Applicable

Other Ingredients:

Sodium starch glycolate, Povidone,
Magnesium stearate (Vegetable source),
Methyl paraben, Propyl paraben.

Directions for use:

Two tablets a day. Swallow with a glass
of water.

Not to be chewed. Do not exceed the
recommended intake.

In addition to Supracal no other
calcium supplementation is
necessary.

سایر ترکیبات:

سدیم استارچ گلیکولات، پوویدون، منیزیم استئارات
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Tablets

NATURES WEALTH FOR GOOD HEALTH

UNiBONE Blend has been developed to help support bone health and reduce risk of osteoporosis. Based on different researches calcium is absorbed more efficiently in small amounts. This product is formulated to release small amounts of calcium plus other ingredients slowly and continuously in order to ensure an efficient absorption in one daily dose

Supplement Facts

Average Values Per Tablet

Calcium Blend (Carbonate & Citrate)	1150	mg
Vitamin D3	500	IU
Magnesium	150	mg
Zinc	20	mg
Vitamin K	60	mcg

RDA: Recommended Daily Allowance

mg: milligram

µg: microgram

IU: International Unit

Vitamin K: Supplementation with Vitamin K has been proven to improve bone density, improves brain function, prevents osteoporosis and support heart health.

Magnesium: Magnesium calms nerves and anxiety, relieves muscle aches and spasms and helps prevent osteoporosis.

Vitamin D3: it helps maintain bones and teeth health and increases calcium absorption.

Zinc: zinc helps body with hormone production, growth and repairment, improves immunity and facilitates digestion.

Slow Release UNiBONE[®] Blend

Allergy Information

Does Not Contain:

- Gluten
- Yeast
- Alcohol preservation
- Salt
- Lactose
- Wheat
- Milk

Recommended Daily Intake:

Two tablets per day with your main meal. Swallow with a glass of water or a cold drink.

Not to be chewed. Do not exceed the recommended intake. Women who are pregnant or planning a pregnancy should consult their doctor before taking this supplement.

Storage:

Store below 30°C in a dry place, out of sight and reach of children.

UNiBONE Blend should only be taken on a full stomach.

UNiBONE Blend can be used for unlimited period as required.

This product is not intended to diagnose, treat, cure or prevent any disease.

For more information about this product please read the leaflet inside.

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UNiBONE[®] Blend

Calcium Carbonate

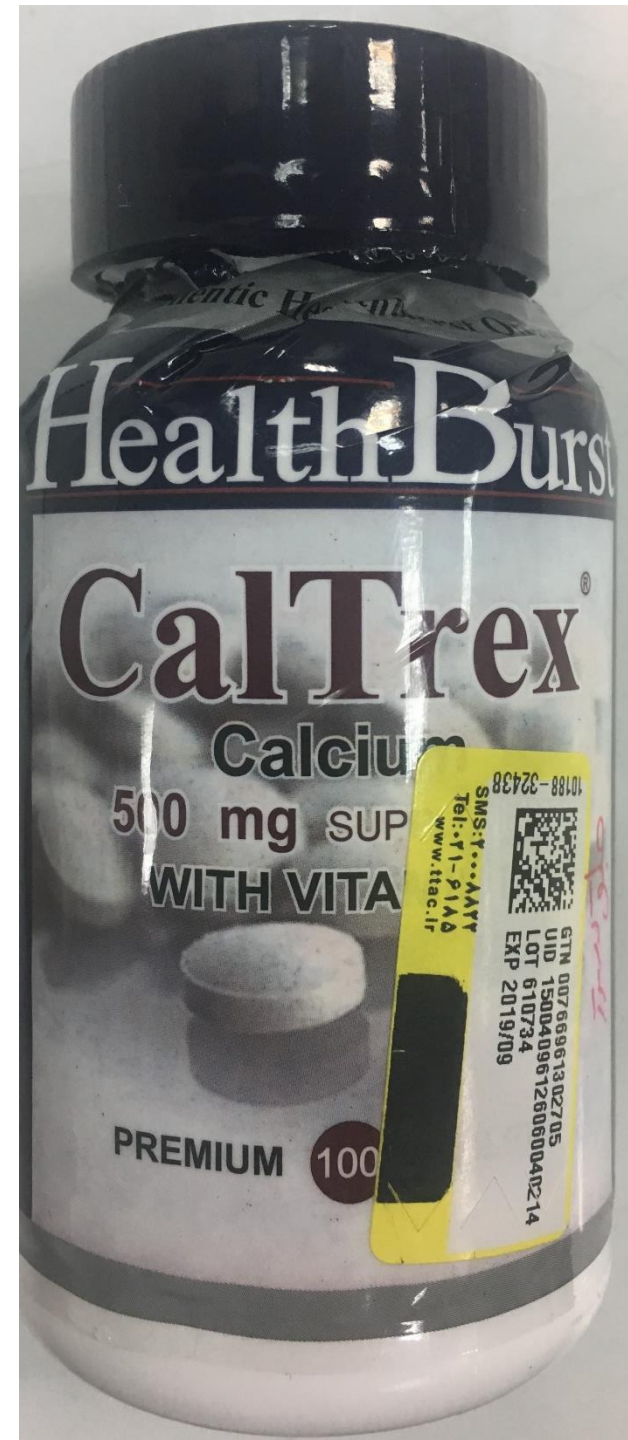
Calcium Citrate

- ◆ Vitamin K
- ◆ Vitamin D3

SLOW RELEASE

Special Dietary Supplement

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Dietary Supplement

For prevention and treatment of osteoporosis, keeping bones strong without calcified plaque formation

Osteo Quinone® provides calcium along with complementary vitamins to help maintain strong bones and teeth as well as the health of the heart, muscles and nerves. Calcium plays several important roles in human health. Calcium and phosphate participate in bone structure, so calcium intake is very important in skeletal formation and bone growth and development. Adequate intake of calcium and vitamin D in a healthful diet is very important for teens, young adults and post-menopausal women. Vitamin D enhances intestinal absorption of calcium. Vitamin K₂ in 100% natural source is really critical for keeping your bones strong and your arteries clean. This vitamin extracts calcium from circulating blood and deposits it in growing or ageing bones, consequently prevents calcification of arteries, kidneys, joints and other soft tissues.

Mechanism of action

Calcium can be found easily in foods and dietary supplements but it is not necessarily absorbed in bones without a number of important biochemical steps. In the absence of proper direction, calcium hasn't gone to bones and maintain in circulation resulting to bone loss and osteoporosis, besides excessive calcium in blood tends to deposit in arteries and kidneys. Vitamin K₂ helps to calcium binding to bones and prevents calcium deposition in arteries and soft tissues. Recent clinical studies have shown that calcium supplementation without vitamin K₂ and D not only cannot significantly prevent osteoporosis but also results to calcification in soft tissues specifically in arteries.

Indications of use

- Osteoporosis
- Help to bone growth and development in prepubertal children
- Cardiovascular health
- Adjuvant therapy with bisphosphonates
- Prevention of bone loss in patients with corticosteroid therapy

Supplement Facts

Ingredients	Amount Per Tablet
Calcium Carbonate	625 mg
Vitamin D ₃	200 IU
Vitamin K ₂₋₇	45 mcg

100
F.C Tablets



Osteo Quinone®
Dietary Supplement

The first calcium supplement
without calcification of soft tissues

Supplement Facts

Serving Size : 3 Softgels

Calcium (Elemental)	900 mg
Magnesium (Elemental)	450 mg
Vitamin D	600 IU

DIRECTIONS: Take three capsules daily, one with each meal or as directed by a health care professional.
Store in a cool, dry place. Keep out of reach of children.

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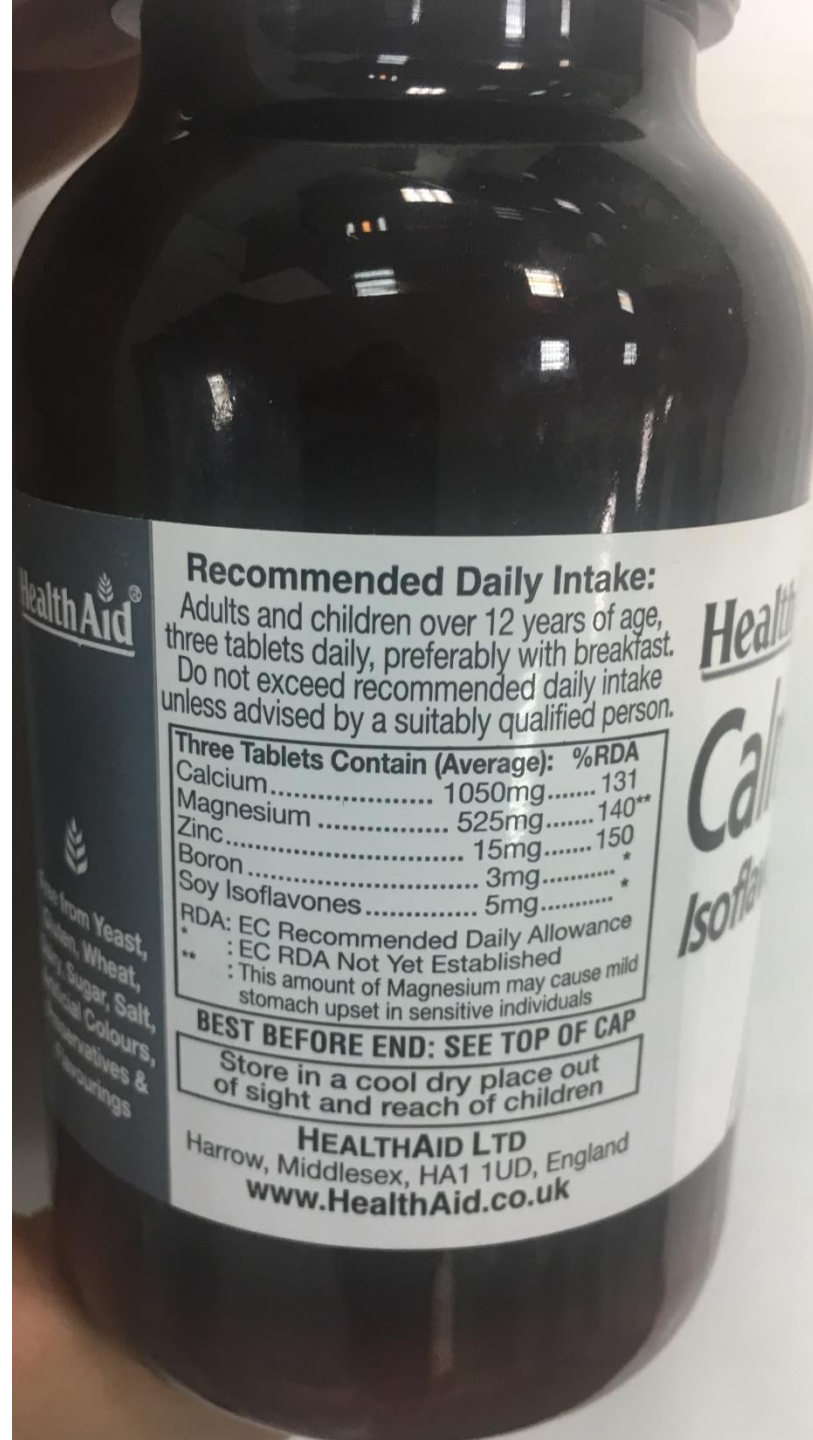
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Biol Trace Elem Res. 2016 Aug;172(2):277-81. doi: 10.1007/s12011-015-0590-2. Epub 2015 Dec 21.

Calcium Fructoborate for Bone and Cardiovascular Health.

Mogoșanu GD¹, Biță A², Bejenaru LE¹, Bejenaru C³, Croitoru O⁴, Rău G⁵, Rogoveanu OC⁶, Florescu DN⁷, Neamțu J⁸, Scorei ID⁹, Scorei RI⁹.

Author information

Abstract

Calcium fructoborate (CF), a natural sugar-borate ester found in fresh fruits and vegetables, is a source of soluble boron. CF contains three forms of borate (diester, monoester, and boric acid) and all are biologically active, both at the intracellular (as free boric acid) and extracellular level (as fructose-borate diester and monoester). At the cellular and molecular level, CF is superior to the boric acid/borate, exhibiting a complex "protective" effect against inflammatory response. CF is commercially available in the USA as a "nature-identical" complex, an active compound for dietary supplements. It provides effective and safe support against the discomfort and lack of flexibility associated with osteoarticular conditions (arthritis and joint degeneration), and improves Western Ontario and McMaster Universities Osteoarthritis (WOMAC) and McGill indexes. In addition, orally administered CF is effective in ameliorating symptoms of physiological response to stress, including inflammation of the mucous membranes, discomfort associated with osteoarthritis disorders, and bone loss, and also for supporting cardiovascular health. Clinical studies have exhibited the ability of CF to significantly modulate molecular markers associated with inflammatory mechanisms, mainly on the elevated serum levels of C-reactive protein (CRP).

KEYWORDS: Anti-inflammatory activity; Calcium fructoborate; Cardiovascular health; Clinical studies; Cytokines; Sugar-borate esters

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- ◆ Magnesium
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Supplement Facts

Average Values Per tablet

Calcium Carbonate	650	mg
MSM	250	mg
Vitamin D3	600	I.U
Magnesium Oxide	100	mg
Zinc Sulfate	20	mg
Vitamin K1	75	mcg

RDA: Recommended Daily Allowance

mg: milligram

µg: microgram

I.U: International Unit

MSM: A well-researched benefit of MSM is that it helps decrease joint inflammation, improves flexibility and restores collagen production.

Vitamin K1: Supplementation with Vitamin K1 has been proven to improve bone density, improves brain function, prevents osteoporosis and supports heart health.

Magnesium: It calms nerves and anxiety, relieves muscle aches and spasms and helps prevent osteoporosis.

Vitamin D3: It helps maintain bones and teeth health and increases calcium absorption.

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UNiFLEX[®]

Allergy Information

Does Not Contain:

- Gluten
- Yeast
- Alcohol preservation
- Salt
- Lactose
- Wheat
- Milk

Recommended Daily Intake:

One tablet per day with your main meal. Swallow with a glass of water or a cold drink.

Not to be chewed. Do not exceed the recommended intake. Women who are pregnant or planning a pregnancy should consult their doctor before taking this supplement.

Storage:

Keep in a cool and dry place. Below 30°C. Keep out of reach of children.

UNIFLEX should only be taken on a full stomach.

UNIFLEX can be used for unlimited period as required.

This product is not intended to diagnose, treat, cure or prevent any disease.

For more information about this product please read the leaflet inside.

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Supplement Fact Per Serving	مقدار در هر واحد	%RDA	ترکیبات مکمل در هر قرص
Calcium Citrate	500mg	NA	سیترات کلسیم
Vit. D3	250 IU	50%	ویتامین D3
Magnesium	80 mg	20%	منیزیم
Zinc	7.5 mg	75%	روی
Copper	1 mg	90%	مس
Manganese	1 mg	50%	منگنز

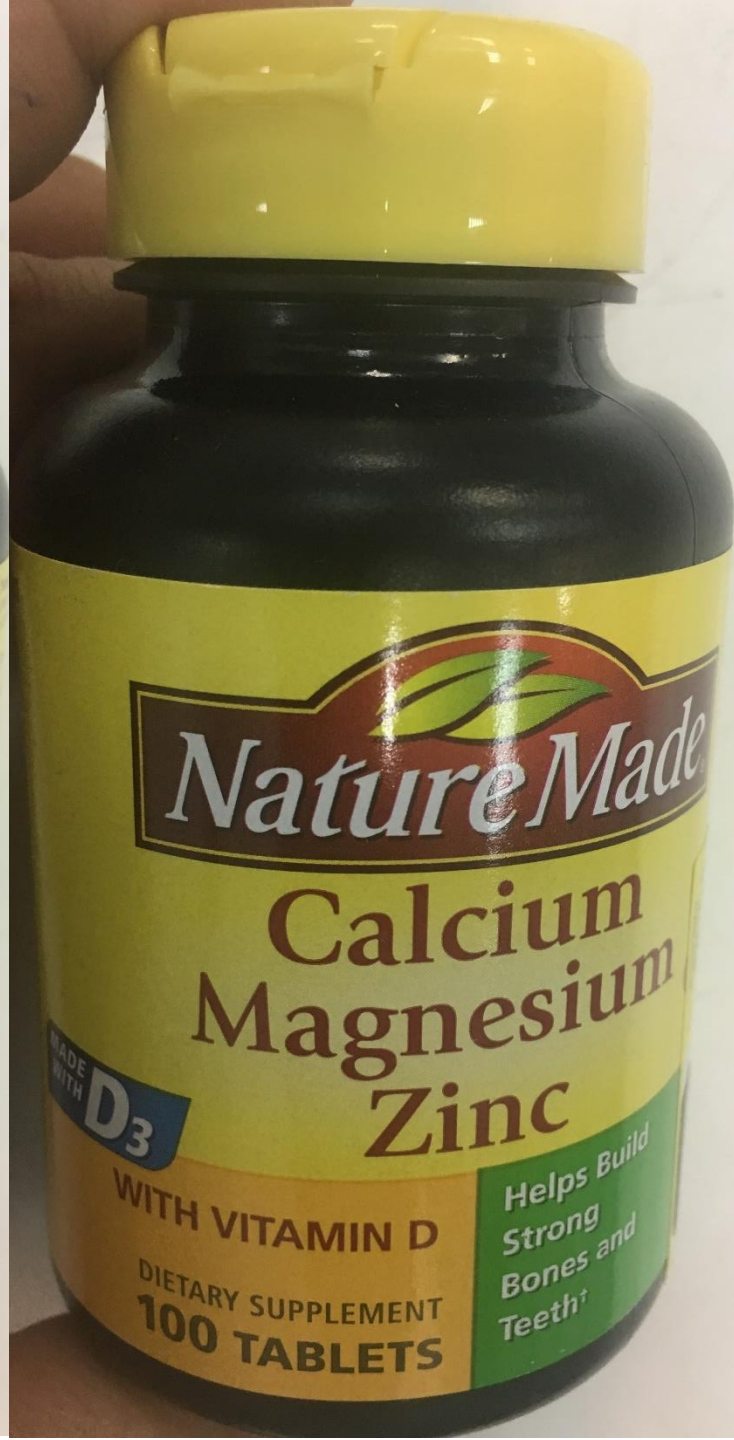
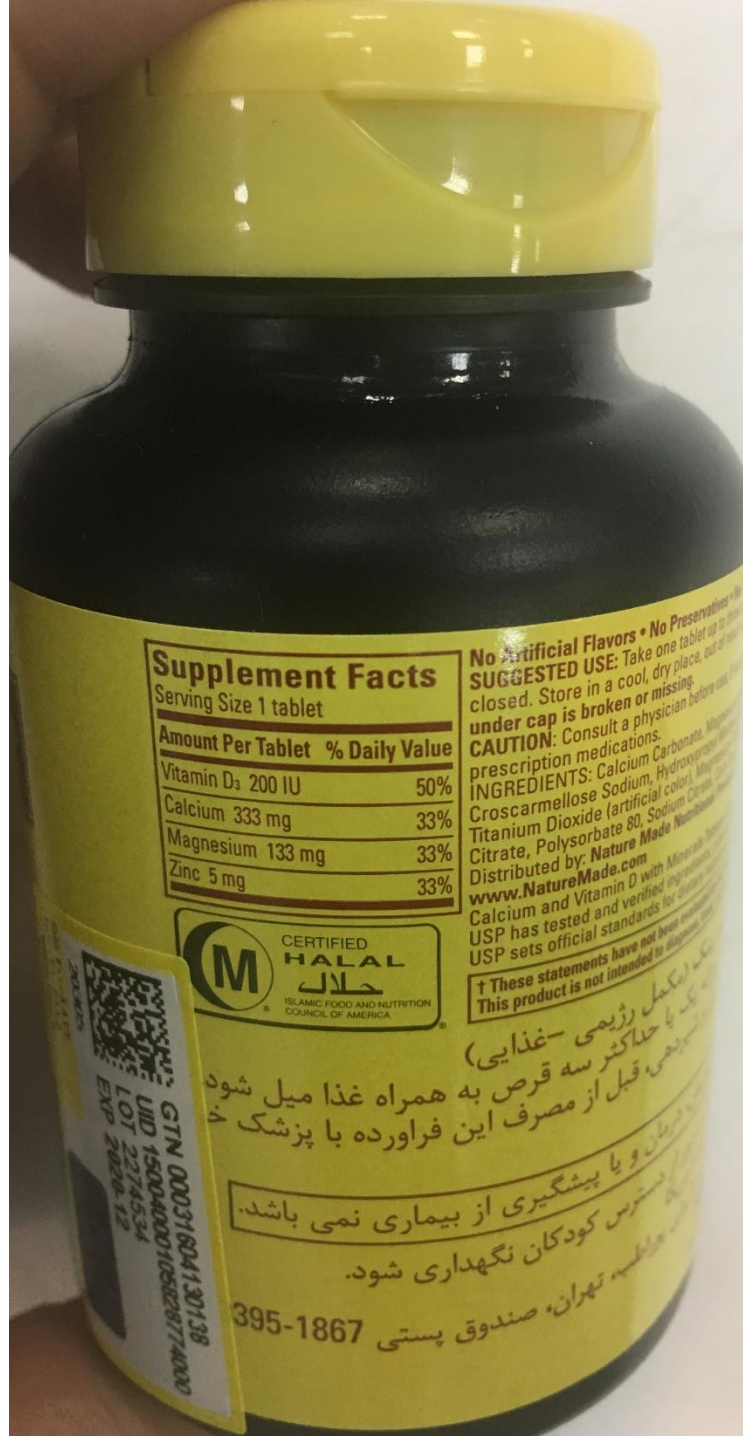
%RDA: Recommended Daily Allowance. NA: Not Applicable.

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+ Mg & 3 other Bone
Health Minerals

30 Coated Tablets





Thank you for your attention

