

Calcium Supplementation:

– Should I or shouldn't I?

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Are you confused about whether to supplement with calcium or not? This is hardly surprising, given conflicting research on the benefits and risks of calcium supplementation and the 'snippets' of media reports, more interested in newsworthiness than the whole story.

Conflict in opinion is certainly evident amongst many health advisors, leaving the public in a quandary with diverse advice. To give you an example, read these recent comments from two experts within different fields:

"After reviewing the entire scope of scientific literature for calcium, we are now more confident than ever in both its health benefits and safety." – Robert P. Heaney, M.D., Osteoporosis Research Centre, Creighton University Medical Centre.¹

Versus:

"I don't think people should take calcium supplements unless they understand there may be a heart hazard that appears in the future." – Dr. Richard Lee, cardiologist and co-editor of the Harvard Heart Letter.²

Aside from the long accepted – yet oversimplified – role of calcium supplementation in preventing osteoporosis, research gained attention for its potential role in preventing type 2 diabetes, obesity and high blood pressure. More recently, however, a re-analysis of all the studies to date (a meta-analysis) produced a 360 degree turn-around, suggesting calcium supplementation may significantly increase the risk of heart attack.

In particular, the EPIC study in Heidelberg followed 24,000 participants aged between 35 and 64 for 11 years, including dietary

history, supplementation, plus other factors that may influence health.³ The study found that a diet deficient in calcium did indeed increase the risk of heart disease by 33% compared to a modest calcium rich diet (820mg daily from food sources). However, no significantly greater benefit for preventing heart disease was found from a diet higher in calcium.

But of particular concern, the EPIC study participants who regularly took calcium supplements had an 86% higher risk of heart attack than those who did not supplement at all. Several other studies have indicated that high doses of supplemental calcium (ie 500mg or greater) may increase risk of cardiovascular disease (regardless of whether calcium was taken with vitamin D or not).

Routinely studies are criticised for being flawed, not excluding the meta-analysis mentioned above. But when faced with conflicting conclusions, perhaps muddled by flawed studies, I always find it wisest to take a step back and consider the whole issue from what we already know in the eyes of holistic nutrition and physiology.

Firstly in respect to dosing: the body always attempts to work to a state of 'homeostasis' (equilibrium) and anything we do to support health must aim to work with and not against this principle. When we eat food, an organic form of calcium is supplied in small amounts throughout the day. We know that the body has a limited capacity to excrete excessive calcium, much of the burden being placed on the kidneys, and we know that kidney stones can occur when people take excessive calcium, particularly with existing renal problems.

The kidneys, however, are not the only place for excess calcium to deposit. We know that arterial plaques will calcify, particularly in areas where the blood vessel has been damaged (eg from smoking, high blood pressure and oxidative stress). This is the body's way of protecting the area, turning a soft waxy plaque of cholesterol turn into a hardened calcified shield. Unfortunately this also stiffens the blood vessel wall and increases the chance of a plaque chipping off and blocking a vessel (eg a heart attack or stroke).

Other areas also prone to calcium deposits

include the joints, bones spurs, the gallbladder (gallstones), thyroid nodules and even fibrocystic breast lumps. While additional health factors may drive these problems, challenging the body with an unnaturally large 'dump' of calcium is potentially adding fuel to an existing fire. The rationale behind the high calcium dosing that still persists with some GPs, plus some of the more dubious retail supplements, especially needs to be questioned. The answer no doubt lies with marketing the misconceived idea of 'more is better' and the convenience of a 'one a day' supplement.

The next issue is absorbability of the various calcium compounds used in prescribed calcium, retail supplements and fortified food. Poorly absorbed calcium compounds are typically sourced from inorganic substances such as limestone, oyster shell and dolomite. These produce an inexpensive but dense form of calcium carbonate, and some risk contamination with other undesirable elements such as lead. Another form of calcium we have not evolved to breakdown is hydroxylapatite or ground animal bone. While it is a great idea to regularly consume mineral rich broths made by slow cooking fish, meat or chicken bones, to simply swallow ground animal bone is not realistically going to breakdown efficiently.

Dense forms of calcium carbonate, in particular, require high stomach acidity to cleave and chelate the calcium into an absorbable form in the gut. Given that stomach acid typically declines as we age (or has been suppressed by acid inhibiting medications), the age group most likely to be using calcium supplements are typically poorly equipped to digest all but the most absorbable forms (not dolomite, limestone, oyster shell, nor ground animal bone).

The supplement industry has somewhat compensated for this by chelating calcium carbonate with substances that have a superior absorption –for example, calcium citrate, calcium lactate, calcium phosphate and calcium orotate (to name a few). However, the next issue is the complexity of synergistic nutrients required to help direct calcium to where it needs to go in the body.

Dietary sources of calcium are typically derived from plants that have converted

Making Your Own 'Calcium Supplement'

Nettle leaf infusion: Infuse one good handful in 1 litre of boiling water for 4-8 hours before drinking (a quick dunk of a tea bag simply won't do!). Drink 1-2 cups daily.

Oatstraw: Boil one good handful in 1 litre of boiling water for 20 minutes. Drink 1-2 cups daily. The gluten content in oatstraw (different to oat grain) is minute, however people with coeliac disease should avoid all oat products.

Mineral Increasing Vinegar (adapted from Susun Weed's recipe): Fill a large glass jar with a few clean eggshells and a selection of the

following herbs (use what is available); fresh dandelion leaves and roots, nettle leaf, raspberry leaf, plantain leaf, red clover flowers. Cover with apple cider vinegar, put the lid on and leave to infuse for 2-6 weeks in a cool place. Strain when ready, label and use within 12 months. Take 1 tablespoon in a little water before meals, drizzle over steamed vegetables or use to make salad dressings.

Note: Seek organically grown herbs. To grow your own mineral rich herbs and vegetables regularly add compost to your soil, ideally with seaweed or other mineral rich matter.

inorganic earth minerals into organic compounds, or animals that have fed on those plants. Within the complex biochemistry of these organic compounds (aka foods) is a balance of inherent nutrient co-factors that are essential for utilising and directing calcium in the body. In particular, magnesium, vitamin D, vitamin K2, silica, boron, copper, phosphorus, potassium and even appropriate amounts of sodium are important cofactors, while an excess or a deficiency of any of these will disrupt calcium metabolism. To mimic this complex nutritional wholeness with a calcium supplement, be it calcium carbonate or calcium chelates, is rather ambitious to say the least.

However, what about the fact that much of our food is now grown in soil that is depleted in minerals? The problem is compounded by a modern diet that has a high reliance on wheat and is low in calcium, and contains excess meat, which induces calcium excretion in the urine by being acid-producing, and highly processed foods that have been depleted of nutrients during manufacture.

Aside from basic preventive health (see inset), consider boosting calcium intake by using mineral rich herbal preparations. Two of my favourites are oatstraw decoction or nettle infusion (see inset), which will provide highly absorbable calcium and a complex of other synergistic nutrients such as silica, potassium, magnesium, vitamin K, to name a few. Susun Weed, author of *Menopausal Years, The Wise Women Way*, writes that a large mug of these herbal brews will provide around 250-300mg of organic calcium.⁴ Susun Weed is also an advocate of home-made herbal vinegars, which efficiently

extract minerals from particular herbs. Apple cider vinegar in itself will also stimulate digestion and improve mineral absorption from the foods it is drizzled over (eg, salads and steamed vegetables).

If this is just not your 'cup of tea' then a calcium supplement that is closest to a wholefood is wisest. Some manufacturers are using *Lithothamnium calcareum*, a calcified seaweed (or strictly speaking a calcified red algae). This type of sea vegetable concentrates minerals from seawater during its growth phase, which later breaks down and settles on the sea bed where it is harvested. It is also considered to be a sustainable source of minerals since the young growing plants are left to continually regenerate.

The form of calcium in *Lithothamnium* is still calcium carbonate, but it has a porous honeycomb structure unlike dense rock and shell sources. The honeycomb structures provide a much greater surface area for stomach acid to break down and chelate the minerals. Several studies have shown that the calcium bioavailability from *Lithothamnium calcareum* is much higher than other dense forms of refined calcium carbonate, including at varying degrees of pH (mimicking various levels of stomach acidity).

Importantly, as *Lithothamnium calcareum* is a whole sea vegetable product it provides other essential nutrient cofactors for calcium utilisation, with the exception of vitamin D (cod liver oil and adequate sunlight exposure can support this). It is still important to be wary of dosing. Ideally split your dose to no more than the equivalent of 250-300mg of calcium twice daily with meals (even better, add cider vinegar at the

same time).

At the end of the day diet should always come first. Making a little extra effort to provide a balanced wholefood diet will provide much greater benefits than all of the promises of the pharmaceutical, supplemental or fortified food industries. Follow the science behind nutrition, but don't get hung up on the conflicting research treadmill. Some things just remain time honoured.

About the Author

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Calcium Rich Food sources:

Aim to eat three or more calcium rich foods per day:

Cooked greens, especially broccoli, kale, bok choy and mustard greens.

Dairy – cultured dairy such as yoghurt and low fat cheeses eg ricotta. For those who can digest milk, seek raw unpasteurised, unhomogenised, organic milk (ask your organic shop or look for a 'milk club' in your area). Avoid excessive dairy intake.

Bone broths

Sesame seeds, eg tahini, hummus.

Sardines and fish with soft ingestible bones (eg tinned Wild Alaskan Salmon)

Seaweeds, eg kelp, karengo, nori

Tempeh (fermented soy food)

Soaked nuts (soak in water overnight to reduce the phytates which inhibit mineral absorption)

Dried fruit, especially organic figs, raisins, dates and prunes.

Molasses

Herbal sources: Oatstraw, Nettle, Raspberry leaf, Sage, Horsetail, Comfrey, Dandelion leaf

Phyto-oestrogen foods and herbs:

These are good for menopausal years providing plant oestrogens that may help soothe the hormonal change and help maintain calcium balance;

Freshly ground flax seeds (store in fridge in small batches), tempeh, lentils, chickpeas, split peas, mung beans, alfalfa sprouts. Phyto-oestrogens herbs: black cohosh, red clover, dong quai, liquorice, kudzu (seek advice from your local medical herbalist or naturopath first).

Things to avoid in order to prevent calcium depletion:

Excessive intake of salt, white flour, coffee, alcohol, meat, soft drinks and highly processed foods.

Peeling the skin off vegetables and fruit.

Excess intake of raw spinach, silverbeet, beet greens and sorrel which are rich in oxalic acid – it is not necessary to avoid these iron rich foods, just don't eat them raw on a daily basis.

Taking fibre supplements with meals.

Fluoride and certain medications.

Smoking.

Lack of exercise.