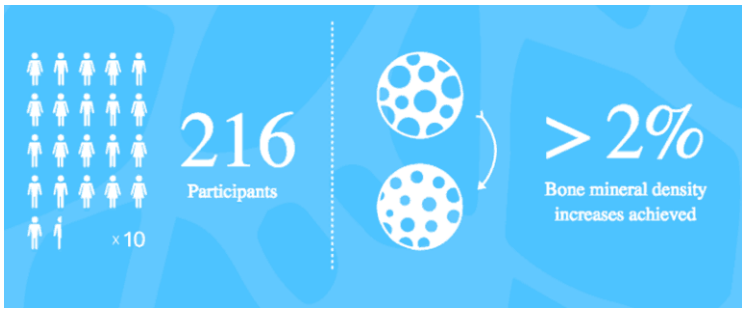
AlgaeCal Plus and Strontium Boost Increase Adult Bone Density after Six Months

Changes in Total Body Bone Mineral Density Following a Common Bone Health Plan With Two Versions of a Unique Bone Health Supplement: A Comparative Effectiveness Research Study. *Nutr J.* 2011. PMID: 21492428.



This human study involving more than 200 women and men found that AlgaeCal formulations increased bone density by more than 2% on average. To gain bone density at all is an unusual finding as humans normally lose approximately 1% of bone each year after age 40. This open label study measured bone density of participants at the beginning, then again after six months of taking AlgaeCal formulations (including strontium citrate).

The primary outcome measure was bone mineral density and a secondary measure was safety as reported in a panel of 43 blood tests along with quality of life questionnaire. Calcium studies often report an "increase in bone density", but it is never an outright increase – it is an increase compared to the placebo group which is declining – so the participants are actually losing bone. This study is a landmark result with a real increase in BMD.

Study Overview

Methods

158 adults agreed to follow an open-label bone-health plan for six months after taking a DXA test of bone density, a 43-chemistry blood test panel and a quality of life inventory (**AC-1**). Two weeks after the last subject completed, a second group of 58 was enrolled and followed the identical plan, but with a different bone-health supplement (**AC-2**).

The study was approved by RCRC Institutional Review Board http://www.RCRCIRB.com, Austin, TX, Protocol number 1252006.

Components of two versions of the bone-health plan provided to subjects in Grp 1 and Grp 2:

Ingredient or Component	AC-1	AC-2
Pedometer-Based Activity Program	Yes	Yes
Health Literacy Information	Yes	Yes
Strontium Citrate (mg)	680	680
AlgaeCal Bone Health Supplement	2,400	2,520
Trace Minerals in AlgaeCal (mg)	1,608	1,688
Calcium (mg)	756	720
Magnesium (mg)*	72	75
Magnesium from magnesium oxide (mg)	0	275
Vitamin D3 (IUs of cholecalciferol)	800	1,600
Vitamin K2 as MK-4 (mg)	1.5	0
Vitamin K2 as MK-7 (mcg)	0	100
Boron (mg)	0	3
Vitamin C (mg)	0	50

*72 mg naturally occurring as magnesium chloride

Results

Both groups experienced a significant positive mean annualized percent change (MAPC) in BMD compared to expectation:

- **AC-1:** 1.15%
- **AC-2:** 2.79%

Both groups experienced a positive MAPC compared to baseline, but only **AC-2** experienced a significant change:

- **AC-1:** 0.48%
- **AC-2:** 2.18%

The MAPC in **AC-2** was significantly greater than that in **AC-1**.

No clinically significant changes in a 43-panel blood chemistry test were found nor were there any changes in self-reported quality of life in either group.

Conclusions

- Compared to an initial formulation, using the revised **AlgaeCal** nutritional supplement, **AC-2**, with additional levels and types of nutrients, while holding all other components of The Plan constant, was associated with significantly greater increases in mean bone density.
- These increases were significantly greater than baseline BMD and as compared to age- and gender-adjusted expected changes.
- No evidence was found of adverse side effects, volunteer bias, drop-out bias, or differences between the age and gender of the participant.
- Additional support for the efficacy of **AC-2** was found by significant differences between compliant and partially compliant participants, suggesting a dose-related effect.

Notwithstanding the absence of an RCT, these findings warrant further study in view of the unusual increases in BMD in both study groups. It is a marked departure from previous studies in which the decline in BMD has been found to be slowed or, at best, maintained.

Denotations

AC-1: AlgaeCal Basic with Strontium Boost
AC-2: AlgaeCal Plus with Strontium Boost