

Calbon N

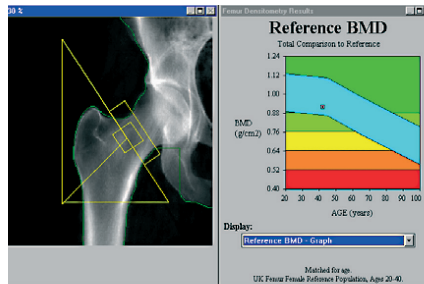
Food and food supplements

Calbon N: a calcium and phosphorus supplement

Calbon N is specially intended for use as a calcium enrichment for food and food supplements. Calbon N, a natural ossein hydroxy-apatite, has excellent properties to prevent a deficiency of calcium in a diet. It contains all ingredients that are necessary for healthy bones. Calbon N has a high calcium level (32%), a high phosphorus level (14%) and contains protein (10%).

Why calcium and phosphorus

Calcium and phosphorus are essential to all life, animal and vegetable, single-celled and multi-celled organisms. Although the inorganic salts, commonly called minerals, comprise a small percentage of total body weight they are as important to the wellbeing as the proteins, carbohydrates and fats that provide energy. Children require calcium and phosphorus in their diet for normal growth, adults require it for maintenance and replacement. Pregnant and lactating women require larger quantities of calcium and phosphorus than other adults because a portion of their intake is utilised by the growing foetus or child.



Calcium also plays an important role in the prevention of osteoporosis, in the coagulation of blood, and for the proper functioning of the nervous system. Osteoporosis is a bone disease that has been identified as a major health problem throughout the world.

How to use Calbon N

Calbon N can be used as an ingredient for various food applications without disadvantageous effects on taste or structure. It is advised to add the Calbon N mesh 200 to the basic food products. Calbon N can be added to cereal products, like flour prepared mixes, baked goods, breakfast cereals and pasta's, and dairy products as for example yoghurt or ice cream.

Furthermore, Calbon N can be taken at meals as a calcium additive in various taylormade shapes, such as tablets, hard gelatine capsules, chewable tablets or oral liquid (high suspension powder). Calbon N mesh 50 for example is extremely suitable for producing tablets because of its direct compressibility. As an oral liquid it is accessible for people having difficulties swallowing tablets, often elderly people.

Improvement
by nature

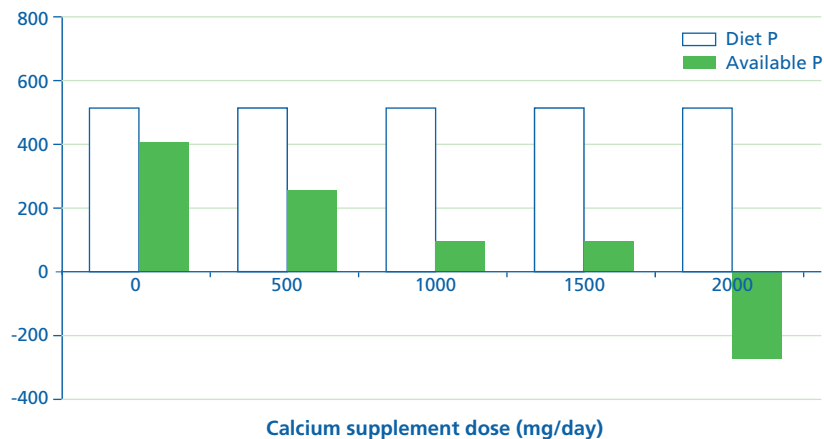


Why does Calbon N score so well

Calbon N is produced by a manufacturing process designed to ensure that the components retain their natural form and physiological properties. The active constituent is not a single chemical entity. It is a mixture of which the main component is a calcium hydroxy-apatite concentrate. This salt is present in microcrystalline form in combination with proteins. A positive fact of bone derived calcium supplements is that they contain phosphorus. Next to calcium, phosphorus is important for healthy bones. Studies indicate that ingestion of a combination of calcium and phosphorus results in better bone building than ingestion of calcium alone. Calcium on its own will bind phosphorus (from food) in the gut, and prevent that the phosphorus will be absorbed in the circulation where it comes available for bone building¹.

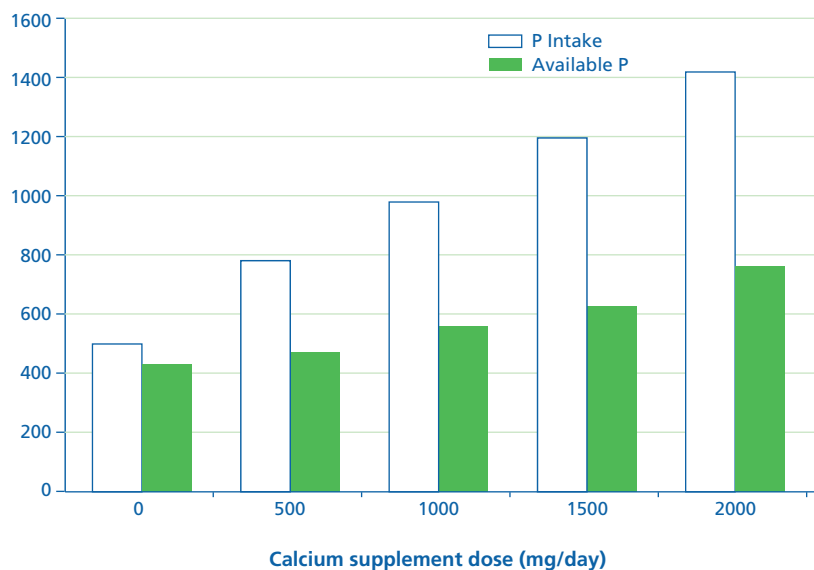
(1 Robbert P. Heaney, MD, FACN. Journal of the American College of Nutrition, vol. 21, no. 3, 239-244 (2002))

Figure 1 Effect of calcium intake on available phosphorus for calcium from calcium citrate or calcium carbonate



Source: Robbert P. Heaney, MD, FACN. Journal of the American College of Nutrition, vol. 21, no. 3, 239-244 (2002)

Figure 2 Effect of calcium intake on available phosphorus for calcium from calcium phosphorus



Source: Robbert P. Heaney, MD, FACN. Journal of the American College of Nutrition, vol. 21, no. 3, 239-244 (2002)

Research findings

Clinical studies show that whole bone calcium supplements have a better effect on bone density. A clinical study of the University of Hull proved that Calbon N prevents the loss of Bone Mineral Density (BMD) in postmenopausal women. The University of Hull together with the Centre of Metabolic Bone Disease did a 6-months double blind placebo controlled study for Sonac Vuren. In this study it was proven that Calbon N prevents the loss of Bone Mineral Density (BMD). With regard to its effect on certain bone markers Calbon N demonstrated statistically significant superiority over placebo. This effect on bone markers is predictive for a positive effect on bone density.

Calbon N prevents the loss of Bone Mineral Density (BMD)

Effects of treatment on BMD

In a 6-month study Calbon N increased Spine Bone mineral density.

Effects on bone markers

Positive effects on bone markers are statistically significant within 6 months after starting the trial.

Adverse effects

Calbon N is well tolerated and does not cause any gastrointestinal symptoms.

Study protocol

The equivalent of 500 mg of calcium was given on a daily bases. Calbon N was given in a hard gelatine capsule, each capsule containing the equivalent of 125 mg calcium and 56 mg phosphorus.

Bone Mineral Density

Dual energy X-ray absorptiometry (DEXA) was used to assess bone density. This technique is widely used because of its ability to assess bone mass at both axial and appendicular sites, its high reproducibility and the low doses of radiation associated with the measurement. Therefore, it represents one of the most reliable techniques to assess BMD at the spine nowadays.



Calbon N
is superior over
Calbon and
placebo

Bone markers

The Friedman X^2 test for 3 related samples was used to test if there were statistically significant differences between randomisation 3 months and 6 months.

The following bone markers were studied:

Serum

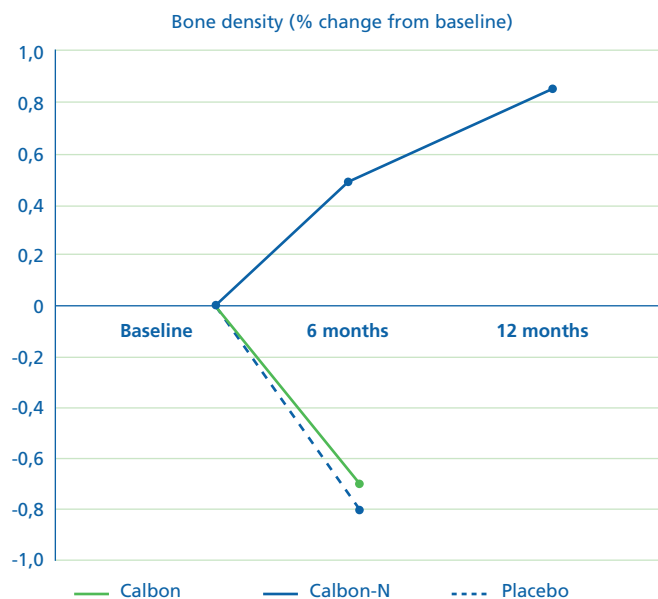
- Alkaline phosphatase (Bone specific isoenzyme)
- Osteocalcin
- Aminoterminal propeptide of type I procollagen

Urine

- Deoxypyridinoline free
- N-telopeptide

Clinical results Calbon N

Use of ossein-hydroxyapatite in postmenopausal osteopenic women



Measurements:

Bone assessments at baseline, and after 3 and 6 months:

- BMD
- Biochemical markers of bone turnover
- Patients on Calbon N allowed to continue for 12 months (extension arm)

Conclusion:

Results on bone density after one year of treatment show a trend towards superiority of Calbon N over Calbon and placebo

Which addition delivers optimal result

The amount of Calbon N depends on the requested amount of calcium to be added.

The recommended daily intake of calcium is > 1000 mg per day according to the World Health Organisation. Calbon N can be taken at meals as a calcium additive. The daily intake can be guaranteed by taking 3 tablets Calbon N per day each with 400 mg calcium and 180 mg phosphorus.

Further, Sonac Vuren recommends the addition of Calbon N powder mesh 200 to basic food products. The effects of addition of Calbon N on the calcium level can be seen in the table below.

Effects of addition of Calbon N on the calcium level

Products	Standard calcium/100 gram	Enriched calcium/100 gram	Added amount per kg
Breakfast:			
Dutch-crisp toast	26 mg	37 mg	350 mg Calbon N
Fruit juice, orange juice	14 mg	25 mg	350 mg Calbon N
Lunch:			
Bread, wholemeal	30 mg	41 mg	350 mg Calbon N
Bread, white	22 mg	33 mg	350 mg Calbon N
Fruit juice, grapefruit	11 mg	22 mg	350 mg Calbon N
Dinner:			
Pasta, wholemeal	40 mg	62 mg	700 mg Calbon N
Pasta	15 mg	37 mg	700 mg Calbon N
Desert:			
Ice cream	100 mg	122 mg	700 mg Calbon N
Yoghurt, low-fat	125 mg	147 mg	700 mg Calbon N
Yoghurt, whole	120 mg	142 mg	700 mg Calbon N
Yoghurt, skim	139 mg	161 mg	700 mg Calbon N

The success factors of Calbon N

- Is a natural calcium and phosphorus supplement
- Provides both of the minerals that bone needs, calcium and phosphorus
- Contains a high calcium level, a high phosphorus level and proteins
- Increases bone density in postmenopausal women
- Has an excellent tolerability and safety profile
- Clinical studies show that whole bone calcium supplements have a better effect on bone

Production

Calbon N has been developed and manufactured in our factory in Vuren, the Netherlands. Calbon N and its production is tested and inspected on different standards continuously, to ensure the highest levels of purity, stability and freshness. It meets the highest microbiological, physical and chemical demands, such as specified in European, British and US Pharmacopoeias. Calcium phosphates are listed as GRAS by the FDA.

Leading quality

World wide the Sonac production systems and products meet the highest quality requirements. Daily veterinary controls in the slaughter-houses, controls of the supplied raw materials at the entry of the production plant, and internal tests during processing are warranted by controls of external laboratories. Sonac meets the HACCP requirements and works according to the ISO 9001 – 2000 and ISO 14001 procedures. This makes pre-eminently Sonac the supplier for those approving quality and best results most important.

Product information on Calbon N

	Calbon N
Moisture (%)	1.5
Protein (%)	10
Calcium (%)	32
Phosphorus (%)	14



sonac

SONAC is a leading manufacturer of reliable ingredients of animal origin. With an active R&D program, reliable processes and sustainable end products Sonac continuously adjusts to market needs. A good geographical spread of locations and a broad portfolio of fats, proteins, minerals and specialties make Sonac a trusted partner for many international producers in food, pet food, feed and fertilizers, worldwide. Sonac is part of Darling Ingredients International.

For more information about Calbon N, please contact us:

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