CALCIVITASE®

Climbing stairs made easy

with calcium, inulin and vitamins D_3 and K
for the preservation of normal and healthy bones

we are
research

biosyn®

Contents

CALCIVITASE® is especially well tolerable and vegetarian

CALCIVITASE® is a food supplement containing calcium, inulin and the vitamins D_3 and K.

CALCIVITASE® at a glance

- Gluten-free
- Lactose-free
- Without yeast and gelatine
- Vegetarian

Vitamin D_3 – the sun vitamin

Vitamin D_3 has a key function for health. It is involved in thousands of regulatory processes in the human body. A vitamin D_3 deficiency can therefore very considerably increase the risk of a medical disorder, primarily in the winter. Because the UV radiation from the sun plays an important role in the formation of vitamin D_3. About 90 percent of vitamin D_3 is created in the skin.

Since the body itself forms vitamin D_3 with the aid of UV radiation from the sun, one would suppose that vitamin D_3 deficiency presents no problem in Germany, at least in the summer.

Vitamin D_3 deficiency is widely distributed and seasonal

A vitamin D_3 deficiency is in Germany is defined at < 20 µg/l 25-hydroxy vitamin D_3, the active form of vitamin D_3, in the blood of. Even in summer, the vitamin D_3 concentration lies below this value in 50 % of women. In winter this problem gets worse: from October to March the intensity of solar radiation in Germany is too low to produce sufficient amounts of the vitamin.

The ability to form vitamin D_3 in the skin declines significantly with age. In severe cases, a vitamin D_3 deficiency in adults leads to osteomalacia (bone softening). Typical symptoms of a vitamin D_3 deficiency are loss of muscular strength and bone pain. Furthermore, a deficiency increases the risk of osteoporosis.

What is the optimal vitamin D_3 level in the body?

In order to determine the vitamint D_3 status, the concentration of 25-hydroxy vitamin D in the blood is measured. A 25-hydroxy vitamin D concentration below 20 ng/ml indicates a vitamin D_3 deficiency, which significantly increases the risk of diverse disorders. A value between 20 and 30 ng/ml is considered to be a restricted vitamin D_3 supply. Nowadays the range between 40 and 80 ng/ml is regarded as the optimal vitamin D_3 level. Particularly for people over 60 years of age, the 25-hydroxy vitamin D concentration in the blood should lie above 30 ng/ml.

Synthesis and functions of vitamin D3

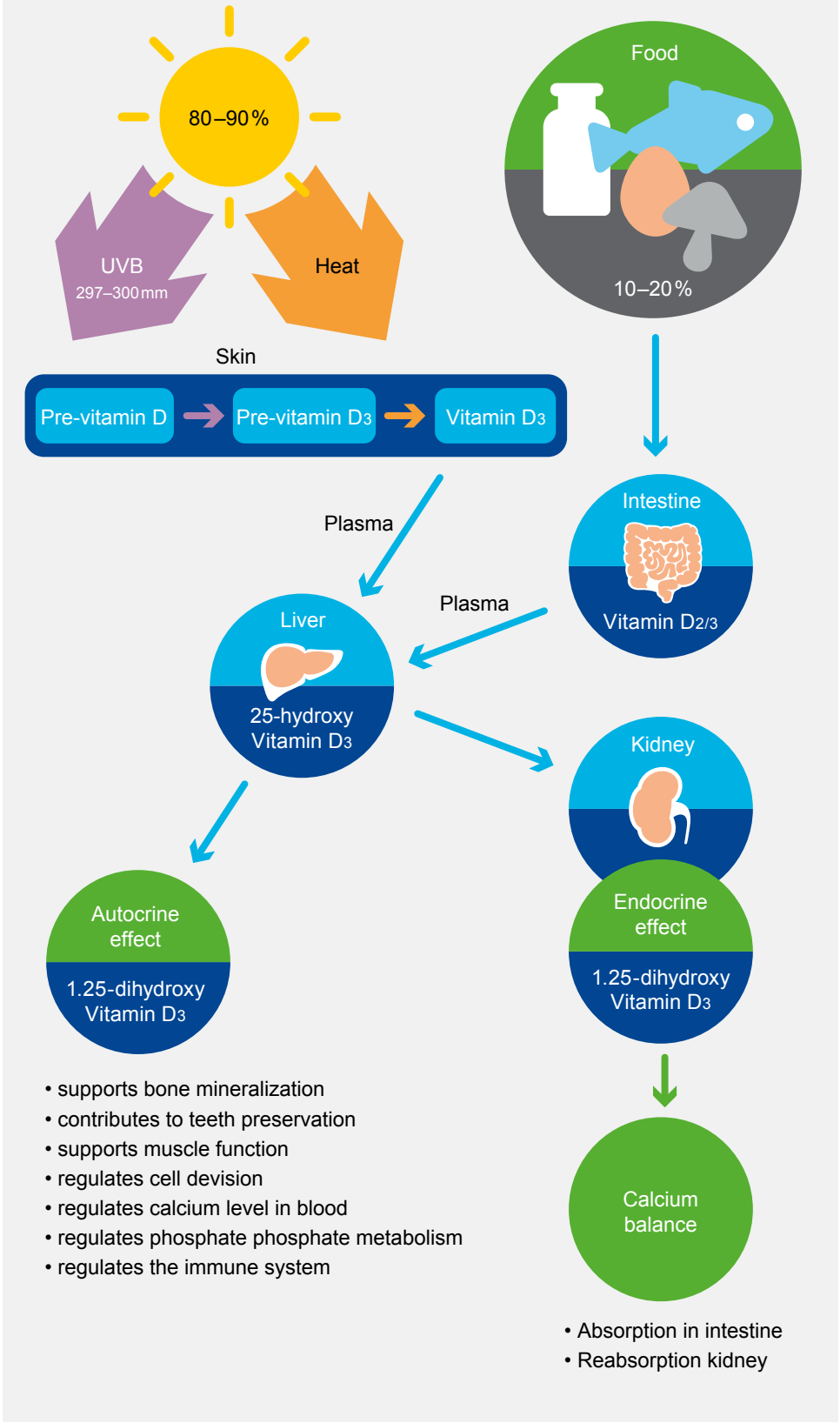

Fig. 1

Calcium and vitamins D3 and K to maintain normal and healthy bones

Calcium and vitamin D play a central role in bone metabolism throughout life: in childhood and adolescence in skeletal development, and in adults and older people in preventing excessive loss of bone mass.

Calcium

Calcium is the building material of bone. As such, calcium is the most important mineral in the body in terms of quantity. As a result, young people, for example, need more calcium every day than adults.

Vitamin D

What role does vitamin D play in bone metabolism? In order for sufficient amounts of calcium to be absorbed in the intestine, vitamin D is also necessary.

Calcium and vitamin D in bone metabolism

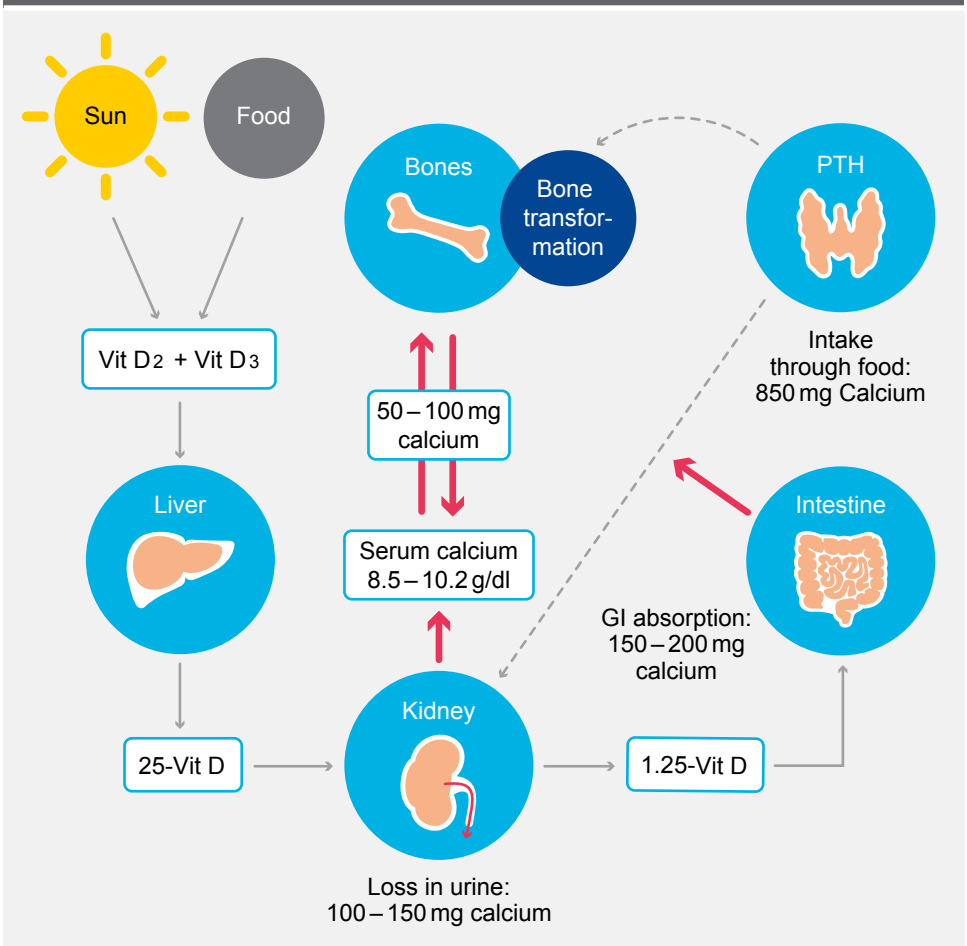

Fig. 2

Calcium in food

Milk and dairy products continue to be the main sources of calcium in daily nutrition. Thus, the daily requirement can be covered with one liter of milk. With fruit, vegetables and nuts alone it is almost impossible.

This makes it difficult for those who are allergic to milk protein or simply do not like milk and dairy products. A source of calcium is often forgotten: mineral water. By drinking mineral water rich in calcium (over 500 mg per liter of calcium), the daily requirement can be covered with 1 – 1.5 liters. Since the calcium content often fluctuates, it makes sense to look carefully at the label.

Exercise works against osteoporosis

Exercise strengthens and trains not only the musculature, but also the bone structure. This also applies in old age and already reduced bone mass. In this case, movement helps to slow down bone resorption.

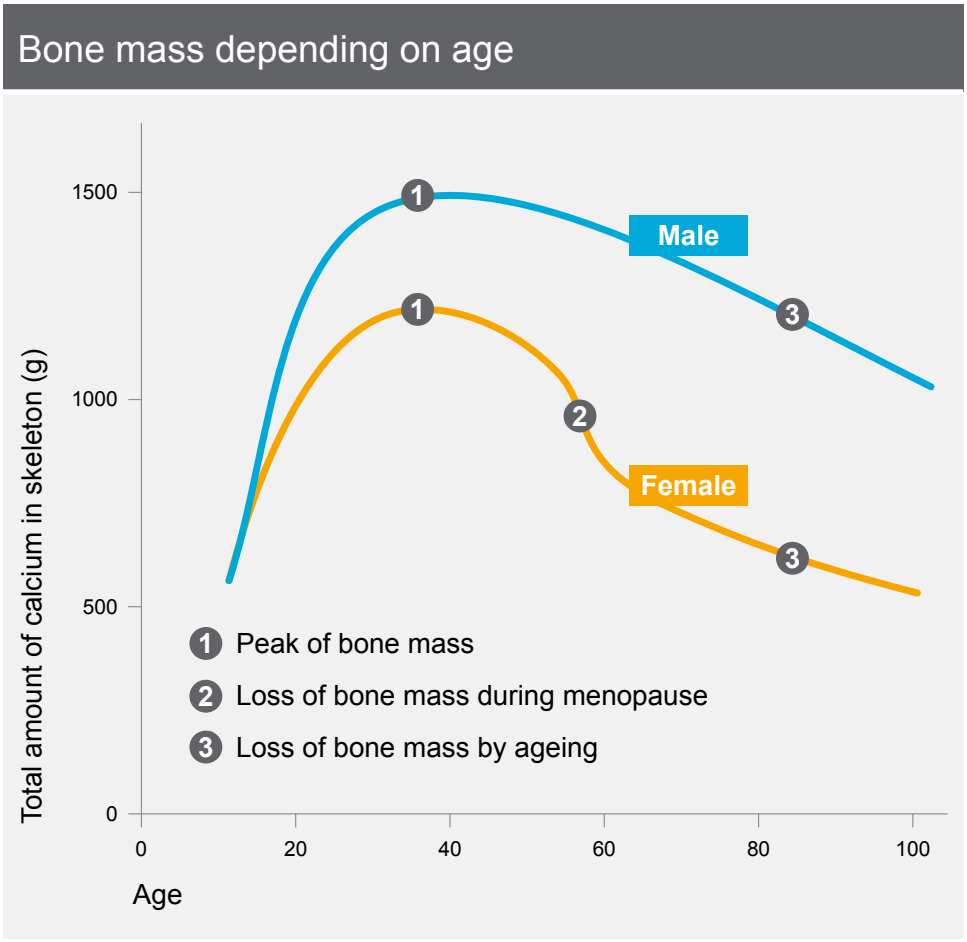

Fig. 3

Calcium contributes to the normal functionality of digestive enzymes and supports the preservation of bone and teeth

How much calcium does the body require?

The German Society for Nutrition (DGE) has compiled the daily requirements of a healthy person in the following reference value table.

Daily requirements of calcium	
Age	Calcium (mg / day)
Infants	
0 to under 4 months	220
4 to under 12 months	330
Children	
1 to under 4 years [a]	600
4 to under 7 years [b]	750
7 to under 10 years	900
10 to under 13 years	1,100
13 to under 15 years	1,200
Adolescents and adults	
15 to under 19 years	1,200
19 to under 25 years	1,000
25 to under 51 years	1,000
51 to under 65 years	1,000
65 years and older	1,000
Pregnant women [c]	1,000
Nursing women [d]	1,000

[a] These are estimated values for nursed infants

[b] These are estimated values for the calcium intake via mother's milk and supplementary food

[c] Pregnant women < 19 years: 1,200 mg

[d] Nursing women < 19 years: 1,200 mg

Vitamin K – wrongly an outsider

Not very many people know about vitamin K and realize how important it actually is for their body. Vitamin K controls not only the blood coagulation, it also activates bone formation.

Three micronutrients are involved in the formation of bone structures (hydroxylapaitite): calcium, vitamin D_3 and vitamin K. An important component of the bone is osteocalcin. The synthesis of these proteins is regulated by vitamin D_3. Vitamin K activates osteocalcin. Osteocalcin can bond to calcium and form hyroxylapatite structures in the bone only after this activation.

Vitamin K hinders calcium in the blood from settling as lethal deposits in the arteries, and thus keeps blood vessels clean. CALCIVITASE® therefore contains a combination of calcium and vitamin K.

Vitamin K controls the blood coagulation and activates bone formation

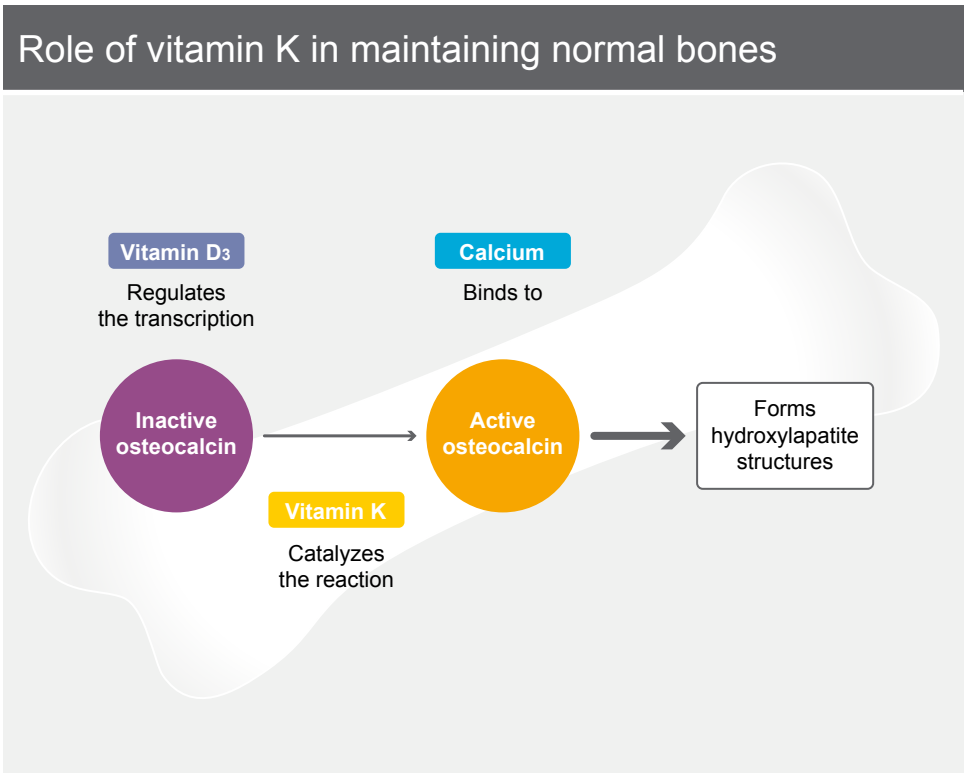
Role of vitamin K in maintaining normal bones
Vitamin D3
Regulates
the transcription
Calcium
Binds to
Inactive
osteocalcin
Active
osteocalcin
Forms
hydroxylapatite
structures
Vitamin K
Catalyzes
the reaction

Fig. 5

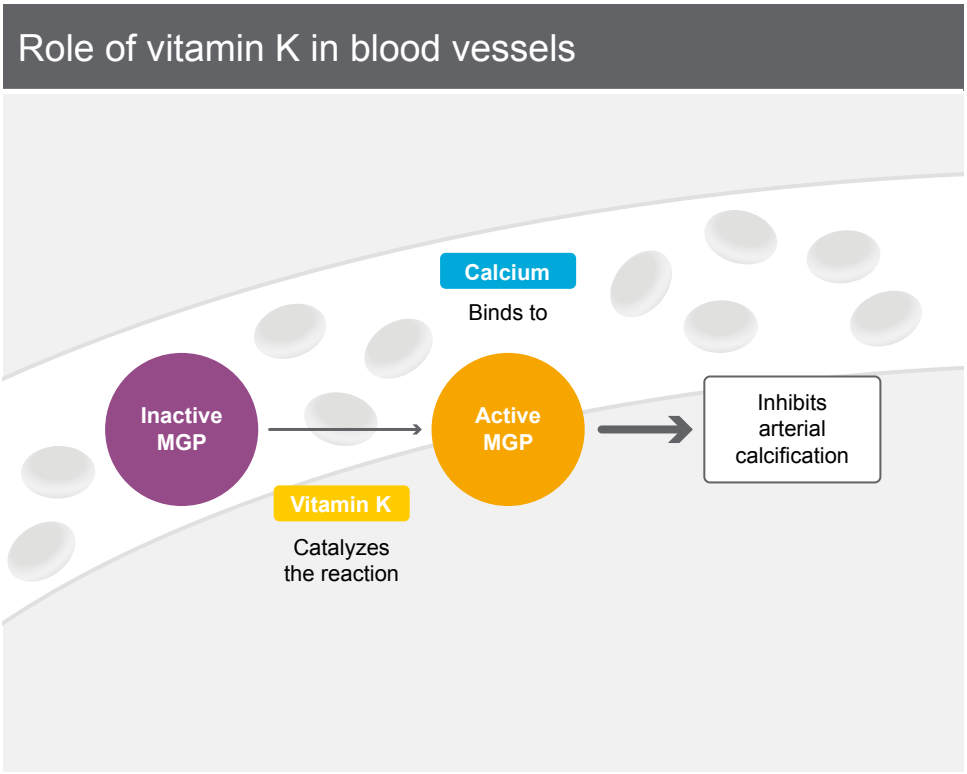
Role of vitamin K in blood vessels
Calcium
Binds to
Inactive
MGP
Active
MGP
Inhibits
arterial
calcification
Vitamin K
Catalyzes
the reaction

Fig. 6

Inulin – a dietary fiber

Inulin is prebiotic, soluble roughage contained in numerous varieties of vegetables and fruits (e.g. bulbous plants, artichokes, topinambur, salsify, asparagus, wheat, oats, bananas, chicory) and therefore has already always been a component of our diet.

Inulin is not broken down by digestive enzymes and reaches the large intestines intact. Only there is inulin fermented by bifido bacteria of the intestinal flora. Inulin is therefore a soluble dietary fiber. Inulin is suitable for diabetics since it does not lead to increased sugar resorption.

Improvement of the calcium intake and bone mineralization

On an average, only about a third of the calcium taken up with the diet is reabsorbed. The remaining two thirds is once again eliminated without being used. Apart from a sufficient calcium intake, an effective availability is therefore important.

Aside from the active intake by the small intestine, calcium can also be taken up in the large intestines by passive diffusion. Calcium is predominantly found in an undissolved form in the large intestines. The fermentation of inulin produces short-chained fatty acids and lactic acid, which reduce the pH value in the large intestines. This shift of the pH value increases the solubility of the calcium and thus favors its intake by the mucous membranes of the large intestines. Several intervention studies have been able to demonstrate improved calcium absorption by inulin.[1]

[1] Coxam V. J Nutr. 2007 Nov; 137(11 Suppl): 2527S-2533S.
Current data with inulin-type fructans and calcium, targeting bone health in adults.

CALCIVITASE® – for the preservation of healthy bones

Average nutrient content of CALCIVITASE®		
	Average content per tablet	Average content per daily dose (3 tablets)
Calcium	250 mg (31 %)*	750 mg (94 %)*
Vitamin D_3	80 I.E. / 2.0 µg (40 %)*	240 I.E. / 6.0 µg (120 %)*
Vitamin K	20 µg (27 %)*	60 µg (80 %)*
Inulin	100 mg	300 mg

* Reference quantities for the daily intake of vitamins and minerals (nutrient reference values – NRV)

Calcium contributes to

- the preservation of bone mass
- reducing bone mineralization loss in post-menopausal women. Low bone mineral density is a risk factor for bone fractures caused by osteoporosis. This applies particularly to women over 50 years of age. The positive effect is achieved with a daily intake of at least 1,200 mg calcium from all sources.

Vitamin K contributes to

- the preservation of bone mass
- normal blood coagulation

Vitamin D_3 contributes to

- the preservation of bone mass
- a normal intake / utilization of calcium and phosphorus
- a satisfactory calcium level in the blood
- the preservation of muscle functionality

Recommended intake

Adults take one tablet of CALCIVITASE® three times daily at meals with enough liquid. A long-term sufficient calcium and vitamin D_3 intake is also especially recommended for women aged 50 and over.

A positive effect is achieved with a daily intake of at least 1,200 mg calcium from all sources.

Long-term use of CALCIVITASE® is recommended.

A varied and balanced diet as well as a healthy lifestyle are of great importance.

CALCIVITASE® is especially well tolerable and vegetarian

Food supplement

CALCIVITASE®, 100 tablets

Ingredients: Calcium carbonate; inulin; rapeseed oil, hardened; maize starch; filler: cross-linked carboxy methyl cellulose; coating: hydroxypropyl methylcellulose; vitamin D_3 (colecalciferol); vitamin K (phylloquinone).

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Information on biosyn Arzneimittel GmbH

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