

Health Effects of Micronutrients and Collagen

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Abstract:

active coral calcium from BEVERONE corporation is a high-quality and highly effective mineral complex based on calcium. Products are made in Japan from petrified corals that live in the sea surrounding the island of Okinawa. It belongs to microelements - its total content in the body is 1000–1800 g, of which 98% is deposited in bone tissue. The calcium ion (Ca²⁺) plays a key role in the physiology of the cell and the whole organism. There are more than 2000 Ca²⁺-dependent proteins and enzymes, the activity of which will be significantly reduced under conditions of calcium deficiency.

Keywords: micronutrients, collagen, bioavailability interaction of active coral calcium and For Beauty.

Of course, calcium is necessary for maintaining the health of nails, hair, skin and teeth, since it is the main element in their structure. Therefore, calcium deficiency affects their condition and appearance. To prevent calcium deficiency, it is necessary to take it additionally in the form of calcium-containing drugs and dietary supplements.

The following main functions of calcium are known:

- regulation of nervous and neuromuscular conduction;
- regulation of vascular tone;
- Stimulates the production of hormones and enzymes;
- compensates for iodine deficiency;
- ensuring the functioning of the immune system;
- participation in the work of the excretory system;
- ensuring reproductive function;
- the formation of bones, dentin and tooth enamel;
- strengthens bone tissue and contributes to the prevention of osteoporosis;
- regulation of the conditions of integumentary tissues - skin, hair, nails, etc.

Lack of calcium in the body leads to:

- decrease in hematopoietic activity, the appearance of anemia;
- osteoporosis, bone loss, bone fractures;
- an increase in the level of acidity in the body, accelerating the aging process;
- Decreased ability of muscles to contract.

Calcium preparations are presented on the market in inorganic (first generation) and organic calcium salts (second generation), soluble and water-insoluble forms. The undeniable advantages of the group of drugs of the last, second generation, are in their effectiveness (including high bioavailability, independence of digestibility from gastric acidity) and safety (reduced risk of urolithiasis, intestinal cancerphilia and constipation). Soluble calcium preparations based on citrate and lactate do not reduce the acidity of the stomach and, accordingly, have a beneficial effect on the absorption of other micronutrients. In this paper, we consider the prospects for the use of soluble preparations based on calcium citrate.

About compensating for calcium deficiency with food.

It would seem that compensation for calcium deficiency is most simply and effectively carried out precisely through the intake of certain types of food. However, the absorption of calcium from food is also characterized by very different bioavailability and side effects. Dairy products (milk, cheese) are a significant source of calcium. Corals contain a large amount of calcium, as well as seaweed (kelp), almonds, hazelnuts, sesame, pistachios, beans, figs, okra, swede, broccoli, and beans [1,3]. First of all, it should be noted that there are daily requirements for essential micronutrients established as a result of numerous clinical and pharmacokinetic studies. When calcium enters the body in amounts below the established daily requirement (800-1500 mg of calcium / day), a deficiency of this microelement occurs. Replenishment of the daily need for calcium with the help of food has a number of significant features.

Firstly, the same product (say, milk), depending on the manufacturer, may contain amounts of calcium that differ by 1.5–2 times, which does not guarantee that the patient will receive all the calcium he needs when using a particular product.

Secondly, even calcium concentrating foods contain milligrams of calcium, making it necessary to consume a significant amount of these foods daily. For example, 100 g of milk contains an average of 100 mg of calcium, 100 g of cottage cheese - 95 mg of calcium, 100 g of sour cream - 90 mg of calcium. Therefore, to fill the daily requirement for calcium (say, 1000 mg / day), every day you need to drink 1 liter of milk, eat 1 kg of cottage cheese or 1100 g of sour cream. Not every healthy person will be able to withstand such a diet.

Third, foods contain thousands of other substances besides essential nutrients, and these substances can have various, often highly undesirable, effects on the body. For example, hard cheeses can contain up to 600 mg of calcium per 100 g of product, so it is enough to eat 150 g of cheese per day. However, this amount of hard cheese contains up to 80 g of saturated fat, and this kind of "calcium diet" will contribute to the increased development of atherosclerosis.

Fourth, dairy allergy and lactose intolerance should be taken into account, which make patients unable to consume unfermented dairy products in quantities sufficient to provide the body with calcium [4]. In the case of consumption of predominantly plant-based calcium-containing foods, calcium absorption from the gastrointestinal tract may decrease with the simultaneous intake of products containing oxalic and phytic acids (for example, spinach or rhubarb) due to the formation of insoluble calcium-oxalate and calcium-phytate complexes, especially against the background of insufficient water load .

Therefore, it is often much more effective, practical, safer and in some cases even more economically beneficial to use special supplements of active coral calcium from the **BEVERONE** corporation aimed at compensating for nutritional deficiencies.

Clinical pharmacology of calcium preparations based on inorganic and organic salts to compensate for calcium deficiency can be carried out both by changing the composition of the diet consumed,

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and using special calcium preparations. A significant problem for the most effective and safe compensation of calcium deficiency is the choice of a pharmacological substance (calcium salt) and a pharmaceutical form of calcium (tablets, dragees, drinking solution). This section provides prolegomena for a differentiated approach to the choice of safe and effective calcium preparations.

The absorption of calcium from drugs depends on factors such as: 1) calcium substance, 2) calcium dose, 3) mode of administration, 4) gastric pH and, of course, 5) co-administration with other drugs. In accordance with the substance, inorganic (first generation) and organic (second generation) calcium preparations are isolated. The vast majority of first-generation calcium preparations are calcium carbonate, which is water-soluble and requires a certain pH range for absorption. Organic calcium preparations are better soluble in water, significantly less dependent on the pH of gastric juice and are characterized by higher bioavailability [5].

On the intended purpose of soluble preparations of organic calcium available evidence from basic research and evidence-based medicine has shown a number of distinct benefits from the use of lactate, gluconate, and calcium citrate. The introduction of drugs based on the above organic salts corresponds to the basic principle of clinical pharmacology - maximum efficiency and maximum safety.

For example, this principle corresponds to the active coral calcium soluble product under the tongue based on organic salts and 60 mineral complexes, as well as a new product in its For Bute line, specifically aimed at improving the condition of skin, hair, teeth and nails. This remedy is available in the form of tablets.

The composition of the Four Bute product (peptides of fish collagen, elastin, fine-grained silicon dioxide, ceramides, calcium stearate, crystalline cellulose) gives the patient excellent results. For this product, drinking water purified from harmful impurities should be used, which is enriched with the dose of calcium stearate specified in the product

Tablets active coral calcium dissolve in water within 1 min, forming a clear solution without sediment. All calcium, when dissolved, goes into solution, which contributes to an increase in the absorption of this microelement in the body compared to tableted forms of calcium gluconate [5].

Active coral calcium tablets with a complex of 60 mineral elements from the BEVERONE corporation with a combination of casein phosphopeptides, iodine, calcium stearate, calcium carmellose, citric acid, vitamin D3, silicon dioxide contain calcium carbonate (shell and coral) in combination with a number of trace elements (Table 1)

Active coral calcium composition (Ca) - 240000 µg/m³, mineral elements: silicon (Si) - 18318 µg/m³, magnesium (Mg) - 14120 µg/m³, sodium (Na) - 2260 µg/m³, strontium (Sr) - 2770 mcg / m³, iron (Fe) - 979 (carotene (4.8 mg), vitamin E (10 mg) and vitamin C (60 mg) (Table 2). The product is intended to support the condition of the skin, its appendages and teeth Each of these active principles of the product has a beneficial effect on the condition of the skin and its appendages.

Table 1

Variety calcium	Source	Amount taken (P)	Absorbtion Qauantity Ca(g)	Absorbtion (%)
Carbonat calcium	Corall	2,5 g	1,0g	40%
	Sink	15,0	1,0 g	6,7%
Calcium lactate	Starch	6,0	1,0 g	16,7%
Cflcium	Animal bones	7,0	1,0 g	14,3%

phosphate	fish			
Glucanate calcium	Egg shell	11,0	1,0 g	9,1%

Table 2

LIST OF MINERAL ELEMENTS CONTAINED IN CORAL CALCIUM FROM OKINAWA ISLANDS IN ICG/M3

Кальций (Ca) 240000	Золото (Au) > 0.05	Сера (S) 1780	Рутений (Ru) 0.081	Гольмий (Ho) 0.091	Цирконий (Zr) > 1	Лантан (La) 2	Ниобий (Nb) > 1	Самарий (Sm) > 0.05
Кремний (Si) 18318	Алюминий (Al) 1693	Калий (K) 830	Церий (Ce) 20	Индий (In) > 0.06	Осмий (Os) > 0.2	Галлий (Ga) 0.094	Олово (Sn) 0.198	Гадолиний (Gd) 0.094
Магний (Mg) 14120	Цинк (Zn) 16	Фосфор (P) 280	Медь (Cu) 23	Иридий (Ir) > 0.04	Палладий (Pd) 0.025	Db 150	Вольфрам (W) 0.1	Иттрий (Y) 3
Натрий (Na) 3360	Серебро (Ag) 7	Висмут (Bi) 4	Литий (Li) 9	Никель (Ni) 7	Платина (Pt) > 0.03	Диспрозий (Dy) 0.18	Рубидий (Rb) 20	Родий (Rh) > 0.02
Стронций (Sr) 2770	Кобальт (Co) 11	Барий (Ba) 10	Теллур (Te) > 0.02	Гафний (Hf) > 1	Марганец (Mn) 20	Празеодим (Pr) 2.73	Эрбий (Er) 5.19	Сурьма (Sb) > 2
Железо (Fe) 979	Германий (Ge) 0.191	Хром (Cr) 20	Скандий (Sc) 0.049	Ванадий (V) 20	Молибден (Mo) > 1	Рений (Re) > 0.2	Европий (Eu) > 0.1	Селен (Se) 14

Calcium plays an important role in the functioning of the skin, hair and nails and is one of the main elements found in the hair and nail plates when studying the mineral composition [6]. Calcium is a key element that regulates the vital activity of epitheliocytes [7], in particular, it is part of the repetin protein that forms the protective layer of the epidermis [8]. The use of calcium preparations helps to reduce the intensity of hair loss, improve the quality of the nail plates (decrease in the index of damage to the nail plates) [4]. Treatment regimens for brittle nails often include moisturizing the nail plate and combined intake of vitamins A, B, C, and D, iron, and calcium [9]. Calcium is involved in the formation of the main tissue of the tooth (dentin) and tooth enamel [1]. Maintaining a sufficient level of calcium in saliva is an important preventive measure that protects against the development of caries and periodontal disease.

For Beaute - a product for beauty and health. Biologically active food supplement that improves the condition of skin, hair, nails.

The main functions of For Beaty:

- prevention of atherosclerosis;
- improvement of flexibility and mobility of joints;
- elimination of wrinkles and sagging skin;
- for the treatment of dry skin, hyperkeratosis, atopic dermatitis, superficial burns, ulcers and other skin diseases in which inflammatory processes are activated;
- slow down the aging process and reduce the risk of skin cancer from excessive ultraviolet radiation;
- омолаживающий эффект.

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Product composition: elastin, collagen, hyaluronic acid, ceramides.

Elastin is a connective tissue protein with elasticity.

Collagen is a protein that forms the basis of connective tissue (80%).

Hyaluronic acid is one of the most important components of the intercellular fluid, an element of connective tissue.

Properties of hyaluronic acid:

- retains moisture in tissues;
- participates in the process of cell division
- provides circulation of lymphocytes;
- blood cells and oxygen in the body.

Ceramides are lipids of the stratum corneum of the skin, the most important element of the natural protective barrier of the skin. Ceramides protect against damage, harmful effects, from the penetration of viruses and bacteria, and prevent moisture loss.

Conclusions: Correction of calcium deficiency is essential for maintaining health. Replenishment of calcium deficiency for the prevention of metabolic disorders of bone tissue, skin, hair can be undertaken using various calcium salts. The essential difference between inorganic (carbonate, calcium phosphate) and organic (citrate, lactate, calcium gluconate) calcium salts lies in their solubility and hence the bioavailability of calcium. The properties of active coral calcium and ForByte from the BEVERONE corporation are provided due to the synergy of the active components that make up its composition, 60 mineral elements for the body's cells. So, active coral calcium in combination with For Beauty promotes the growth of hair and nails; prevents fragility and delamination of the nail plates; prevents hair loss and split ends; strengthens teeth; improves skin condition.

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