GETTING THE MOST OUT OF YOUR CALCIUM SALT

GIVOCAL

ADVANTAGES TO USE GIVOCAL

1 A "3 IN 1" SALT

It supplies calcium, glycerol and phosphorus.

2 DOUBLE INTEREST

This type of calcium salt has a physiologic and a metabolic interest due to the glycerophosphate, which is absent in inorganic calcium salts.

3 A SUPERIOR WAY

As part of nutraceuticals or health food, GIVOCAL™ is a highly bioavailable source of calcium.

4 SCIENTIFIC EVIDENCES

Calcium glycerophosphate shows excellent absorption. Some other clinical studies show positive effects on bone and teeth development.

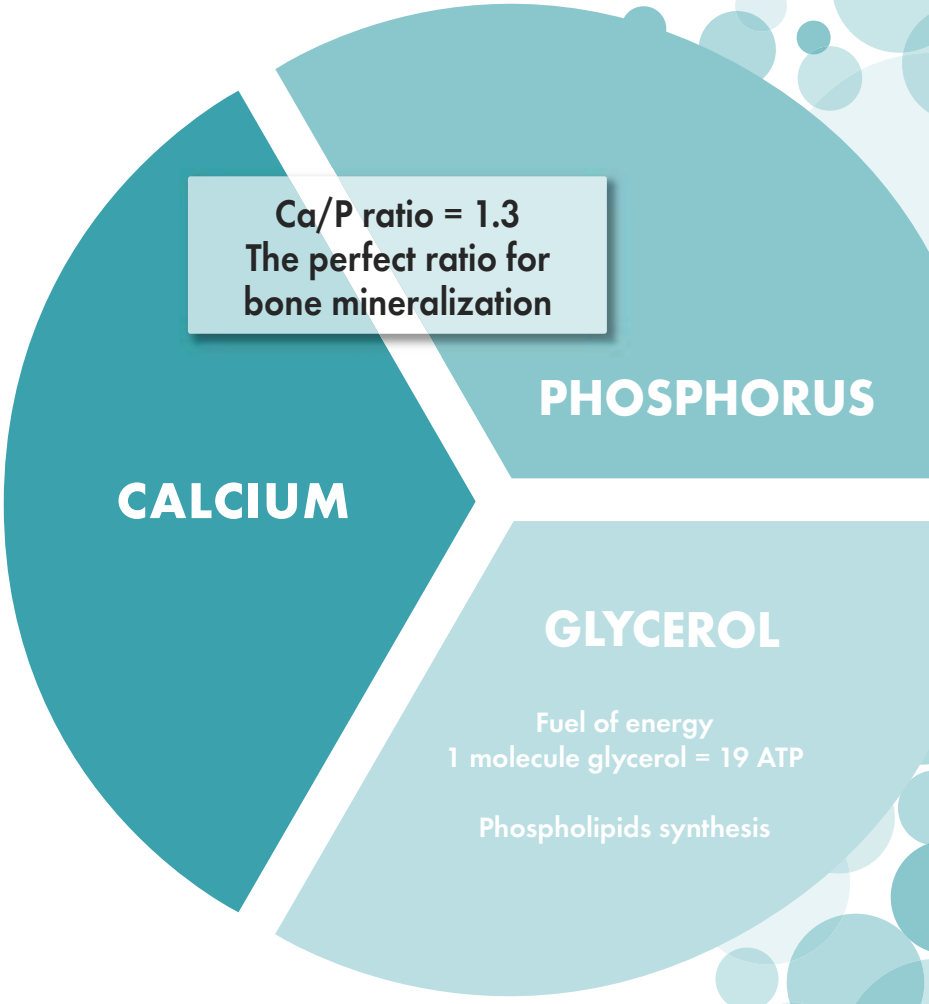
5 A CHELATE

Glycerophosphate is an excellent vector for delivering calcium into the GI tract.

CALCIUM BIOLOGICAL INTEREST

Calcium is the most abundant mineral in the body. It is commonly associated with the formation and metabolism of bone. Over 99 percent of total body calcium is found as calcium hydroxyapatite ($Ca_{10}[PO_4]_6[OH]_2$) in bones and teeth, where it provides hard tissue with its strength.

Calcium in the circulatory system, extracellular fluid, muscle, and other tissues is critical for mediating vascular contraction and vasodilatation, muscle function, nerve transmission, intracellular signaling, and hormonal secretion. Bone tissue serves as a reservoir for and source of calcium for these critical metabolic needs through the process of bone remodeling (Ross et al., 2011). The balance between bone resorption and deposition changes with age. In aging adults, particularly among postmenopausal women, bone breakdown exceeds formation, resulting in bone loss that increases the risk of osteoporosis over time (National Institute of Health, 2013).



TECHNICAL INFORMATION

Composition: Ca/P ratio=1.3
19.1% Ca content
14.6% P content

Taste & Odour: Neutral
Solubility: Water soluble
Appearance: Fine white powder

BIOAVAILABILITY

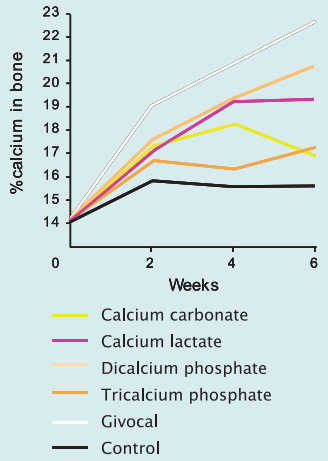
Most calcium compounds given orally as a source of calcium are soluble in gastric acid but are converted mostly into insoluble calcium carbonate in the duodenum so that only a fraction of the calcium is available for absorption. Absorption of calcium salts therefore depends greatly on their solubility and stability in a wide pH range.
A study on the capacity of acidity neutralization made on several calcium salts shows that **GIVOCAL™ has the smallest buffer power and then it is the best solubilized** in the stomach. It also stays solubilized in the small intestine.

These results were confirmed by an in vitro study made on the gastrointestinal model TIM-1 of TNO laboratory (The Netherlands) which compared the absorption of GIVOCAL™ and calcium carbonate. With the same amount of calcium ingested (introduced into the system), GIVOCAL™ permits a better absorption of calcium: **4 times more calcium is absorbed with GIVOCAL™ than with calcium carbonate** (internal results).

Moreover, a recent study made on rats shows that, with the same amount of calcium ingested, **GIVOCAL™ has twice as less of calcium excretion than calcium carbonate** (internal results). These results suggest that GIVOCAL™ has a higher bioavailability than calcium carbonate.

Other in vitro or in vivo studies show that GIVOCAL™ allows a **good assimilation of calcium by the bone tissue, has a cariostatic effect on teeth and shows a beneficial action on the nervous system** (internal results).

Increase in bone calcium



EU AUTHORIZED HEALTH CLAIMS FOR GIVOCAL™

CALCIUM

- Calcium contributes to normal blood clotting
- Calcium contributes to normal energy-yielding metabolism
- Calcium contributes to normal muscle function
- Calcium contributes to normal neurotransmission
- Calcium contributes to the normal function of digestive enzymes
- Calcium has a role in the process of cell division and specialization
- Calcium is needed for the maintenance of normal bones
- Calcium is needed for the maintenance of normal teeth

PHOSPHORUS

- Phosphorus contributes to normal energy-yielding metabolism
- Phosphorus contributes to normal function of cell membranes
- Phosphorus contributes to the maintenance of normal bones
- Phosphorus contributes to the maintenance of normal teeth

ISALTIS

Site Givaudan Lavirotte
56 rue Paul Cazeneuve - 69008 Lyon - France
Tel : +33 4 7861 5577 - contact@isaltis.com
www.isaltis.com