

Calcium D-Glucarate



Supports the body's defense against toxins and excess steroid hormones

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Calcium D-Glucarate is calcium bound to d-glucaric acid, which is a natural compound produced in small amounts by the human body and is abundantly found in various plant foods such as broccoli, cabbage, kale, apples, oranges, and grapefruit. Research shows that d-glucaric acid derivatives such as calcium d-glucarate help support the body's defense against toxins and excess steroid hormones, making calcium d-glucarate a potential agent in aiding detoxification and protecting against various hormone-dependent cancers.

Benefits:

- ▶ Supports liver detoxification of xenobiotics
- ▶ Supports healthy hormone metabolism and clearance
- ▶ Possible anti-carcinogenic properties, especially in hormone-dependent cancers

Mechanism of Action

In the GI tract, calcium d-glucarate is metabolized into three compounds, the most active being D-glucaro-1,4-lactone. This metabolite increases the detoxification of carcinogens by inhibiting β -glucuronidase, an enzyme that can deconjugate (break apart) potential toxins which are being eliminated via the phase II detoxification glucuronidation pathway, allowing them to be reabsorbed back into the body instead of being excreted.

During liver detoxification some toxins, including many hormones like estrogen, are cleared via glucuronidation; a process where glucuronic acid is attached to a toxin (i.e., the free carcinogens or steroid hormones) in order to create a less toxic conjugate that can be readily eliminated by the body. In the case of liver detoxification, the substrates are most often xenobiotic substances – those that are foreign to the body – such as drugs and pollutants, as well as endogenously produced compounds like excess estrogens and androgens, mineralcorticoids, glucocorticoids, fatty acid derivatives, retinoids, and bile acids. These toxins and hormones, bound to glucuronic acid, are now ready to be safely eliminated.

Elevated β -glucuronidase activity is associated with an increased risk for various types of cancer, in particular those that are hormone-dependent such as breast and prostate (Zóltaszek R et al, *Postepy Hig Med Dosw*, 2008). Therefore, inhibiting this enzyme increases the safe excretion of conjugated, toxic compounds and decreases their activity. Research shows that D-glucaro-1,4-lactone and its precursor calcium-d-glucarate may exhibit anti-cancer properties by altering the production of steroid hormones along with various changes in the body's hormonal environment (Walszek Z et al, *Cancer Detect Prev*, 1997).

Calcium D-Glucarate Supplementation

Glucaric acid is not available as a supplement, while calcium d-glucarate is. Oral supplementation of calcium d-glucarate is an ideal way to provide the body with an efficient, slow-release source of D-glucaro-1,4-lactone. By supplementing d-glucarates, in this case, the stabilized calcium form, one can favor the body's natural defense mechanism for eliminating toxins, carcinogens and other tumor-promoting drugs, thus reducing their effects.

Supplement Facts

Serving Size 2 capsules

Servings Per Container 30

Amount Per Serving	% Daily Value	
Calcium (as Calcium D-Glucarate USP)	150 mg	12%
Calcium D-Glucarate USP	1.2 g	*

*Daily Value not established.

Other Ingredients: Microcrystalline cellulose, cellulose (capsule), vegetable stearate.



Anti-Cancer Properties

The main focus of the investigation of the anti-carcinogenic properties of d-glucaric acid and calcium d-glucarate has been on breast cancer, where studies have shown that oral supplementation of calcium-d-glucarate in rats can inhibit mammary tumor development by over 70% (Walszek Z *et al*, *Carcinogenesis*, 1986). Research shows that calcium d-glucarate helps to promote the proper elimination of excess estrogens. It works by inhibiting or delaying what is known as the second or 'promotion' phase of mammary carcinogenesis by decreasing endogenous levels of estradiol and precursors of 17-ketosteroids (metabolites of androgenic sex hormones) (Walszek Z, 1986). This is significant since many cases of breast cancer are estrogen dependent.

The mechanism of action of d-glucaric acid appears to be the same in regards to other various types of cancer (i.e., prostate, colon, liver). The key lies in the inhibition of β -glucuronidase, where the carcinogens are safely excreted from the body, and with the process of supplying glucuronide to the liver as a substrate to conjugate toxins during phase II hepatic detoxification.

Calcium d-glucarate also appears to possess anti-inflammatory properties. It has been shown to decrease the level of pro-inflammatory cytokines and increase the level of anti-inflammatory cytokines, helping to inhibit the growth of cancerous tumors in the lungs (Zoltaszek R, *et al*, *Oncol Lett*, 2011).

Thus, calcium d-glucarate should be considered integral in assisting the detoxification process as it helps to prevent the recycling of potentially harmful, proliferative estrogenic hormones and environmental toxins, while promoting liver detoxification.

How to Take

- As a dietary supplement, take two capsules per day with meals, or as directed by your health care practitioner.
- Under the direction of a health care practitioner, dosages of 2,000 – 3,000 mg may be recommended for certain situations.

References

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