

Quercetin



Applications

- Immune Health
- Zinc & Vitamin C Absorption
- Antioxidant Support
- Cardiovascular Support
- Healthy Inflammatory Response Support

Introduction

NutraMedix Quercetin is a yellow polyphenol bioflavonoid.¹ Of the six flavonoid subgroups, quercetin is classified as a flavonol.² NutraMedix Quercetin is in the form of quercetin dihydrate, which is chemically known as 2-(3,4-dihydroxyphenyl)-3,5,7-trihydroxychromen-4-one; dihydrate (IUPAC) with a molecular formula of $C_{15}H_{14}O_9$.³⁻⁵ It is also called pentahydroxyflavone dihydrate.

Quercetin is available in several forms as a dietary supplement.⁶ While flavonoid forms such as quercetin dihydrate are insoluble in water, they are highly available under physiological conditions in the presence of biological salts, especially to phagocytic and dendritic cells.⁷ Compared to the glycoside, aglycone, and rutoside forms, quercetin dihydrate has the highest bioavailability.⁷ Quercetin bioavailability is determined by absorption, metabolism, and elimination, the last two of which are fairly rapid.³ The gut microbiome and individual genetics are also factors. Dietary fat and/or fiber may help increase absorption, so it is best to take quercetin with meals or snacks.^{6,8} Daily consumption is recommended for optimal support as the half-life is between 11 and 28 hours.³

Quercetin can be found in many plants, including foods such as yellow and red onions, kale, apples, berries, grapes, citrus, red wine, and tea.^{3,9} It can also be found in botanicals such as pagoda tree, elderberry, milk thistle, green tea, and

ginkgo.¹⁰ NutraMedix Quercetin is purified from the flowers of *Sophora japonica*, commonly known as the pagoda tree. *S. japonica* buds (*huai mi*) and flowers (*huai hua*) have been used in traditional Chinese health practices for centuries to clear heat.¹¹

NutraMedix Quercetin is free of gluten, sugar, soy, and dairy. It is also free of GMOs, mold, and yeast. NutraMedix rigorously follows current good manufacturing practices (cGMP), as do our suppliers, including stringent ID testing, microbial testing, and heavy metal testing. This testing is conducted on both the raw material and after encapsulation.

Immune Health

Quercetin may help maintain the Th1/Th2 ratio already within the normal range.¹² It may also support healthy basophil and mast cell stability, consequently maintaining Ca^{2+} influx, histamine, leukotrienes and prostaglandins already within the normal range.¹²⁻¹⁴ Rat studies have shown that more than 25% of absorbed quercetin can be found in the lung tissue,¹⁵ which may help support a healthy seasonal immune response.⁷

Quercetin may help maintain levels of cytokines such as IL-1-alpha, IL-6, IL-8, and TNF already within the normal range.^{3,14} It may also help maintain leukotrienes and PGD_2 ,^{14,17} serum IgE and eosinophil levels,¹³ and NF-kappaB and MAPK, already within the normal range.^{13,16,17}

Additionally, Quercetin may help maintain dendritic cell function already within the normal range, supporting the connection between innate and adaptive immunity.¹⁷ It may also help maintain upper respiratory health ($p=0.020$; $p=0.004$).^{18,19}

Zinc and Vitamin C Absorption

Quercetin and other dietary polyphenols act as zinc ionophores, supporting zinc's entrance into cells independently of zinc transporters.²⁰ In mouse studies, quercetin coadministered with zinc showed more effective intracellular zinc support than zinc administered alone.²⁰

Quercetin and vitamin C have a synergistic relationship; bioflavonoids such as quercetin may help increase the absorption of vitamin C, and vitamin C may help recycle oxidized quercetin.²¹⁻²³

Other Support

Healthy Inflammatory Response Support

Quercetin may help with healthy inflammatory response through supporting normal function of the lipoxygenase (LOX) and cyclooxygenase (COX) pathways, helping maintain arachidonic acid metabolism already within the normal range.⁴ Quercetin may help maintain levels of TNF-alpha;⁴ PDE4;¹² and IL-4, IL-5, and IL-13, already within the normal range.¹³

Healthy Cardiovascular Support

Quercetin may help support cardiovascular health. It may help maintain blood pressure already within the normal range ($p=0.049$),²⁴ help

maintain fasting plasma insulin ($p<0.03$) and insulin sensitivity ($p<0.04$) already within the normal range,²⁵ and help maintain nitric oxide (NO) and plasma endothelin-1 already within the normal range ($p<0.05$).²⁶

Antioxidant Support

Quercetin may help support healthy oxidative balance by maintaining levels of glutathione (GSH) already within the healthy range.²⁷ It may also help keep levels of Nrf2, PPAR-alpha, PPAR-gamma, and HO-1 already within the normal range.¹³

Safety and Cautions

Quercetin is generally well tolerated and has been safely used in amounts up to 1 gram daily for up to 12 weeks.^{28,29} Side effects may include headache and tingling of the extremities.³⁰ Quercetin may have additive effects with hypoglycemic and hypotensive medications.³⁰ It may increase the levels and adverse effects of cyclosporine, diclofenac, losartan, pravastatin, and quetiapine.³⁰ It may also increase the levels and adverse effects of CYP2C8, CYP2C9, CYP2D6, and CYP3A4 substrates; OAT1 and OAT3 substrates; OATP substrates; and P-glycoprotein substrates.³⁰ Additionally, quercetin may decrease the levels and effectiveness of midazolam and of quinolone antibiotics.³⁰ Quercetin should be avoided in pregnancy and breastfeeding.

Safety is not documented in breastfeeding or pregnant women, or in children under age 3, due to insufficient safety research.

***This statement has not been evaluated by the Food and Drug Administration. This product is not intended to treat, cure, or prevent any diseases.**

References

¹Panche, A.N., Diwan, A.D., et al. (2016). *Journal of Nutritional Science*, 5, e47.
²Al-Ishaq, R.K., Abotaleb, M., et al. (2019). *Biomolecules*, 9(9), 430.
³Li, Y., Yao, J., et al. (2016). *Nutrients*, 8(3), 167.
⁴PubChem. (2021). Quercetin. Retrieved 28 August 2021, from <https://pubchem.ncbi.nlm.nih.gov/compound/Quercetin>
⁵PubChem. (2021). Quercetin dihydrate. Retrieved 29 August 2021, from <https://pubchem.ncbi.nlm.nih.gov/compound/5284452>
⁶Dabeek, W.M., & Marra, M.V. (2019). *Nutrients*, 11(10), 2288.
⁷Jaffe, R., & Mani, J. Chapter 29 - Polyphenolics Evoke Healing Responses: Clinical Evidence and Role of Predictive Biomarkers. *Polyphenols: Mechanisms of Action in Human Health and Disease*. January 2018:403-413.
⁸Guo, Y., Mah, E., et al. (2013). *Molecular Nutrition & Food Research*, 57(5), 896-905.
⁹Jafarinaia, M., Sadat Hosseini, M., et al. (2020). *Allergy, Asthma, and Clinical Immunology*, 16, 36.
¹⁰Drugs and Lactation Database (LactMed) [Internet]. (2021). Bethesda (MD): National Library of Medicine (US). Available from: <https://www.ncbi.nlm.nih.gov/books/NBK501922/>

¹¹Eastland Herb. (2018). *Eastland Herb - Chinese Herbal Medicine: Materia Medica and Formula & Strategies* (4.3). [mobile app]. <https://apps.apple.com/us/app/eastland-herb-chinese-medicine/id737380894>.
¹²Mlcek, J., Jurikova, T., et al. (2016). *Molecules*, 21(5), 623.
¹³Karuppagounder, V., Arumugam, S., et al. (2016). *Drug Discovery Today*, 21(4), 632-639.
¹⁴Weng, Z., Zhang, B., et al. (2012). *PLoS One*, 7(3), e33805.
¹⁵Juriková, T., Mlcek, J., et al. (2015). *Global Journal of Allergy*, 1, 037-039.
¹⁶Chen, H., Lu, C., et al. (2017). *International Immunopharmacology*, 48, 110-117.
¹⁷Huang, R.Y., Yu, Y.L., et al. (2010). *Journal of Immunology*, 184(12), 6815-6821.
¹⁸Heinz, S.A., Henson, D.A., et al. (2010). *Pharmacological Research*, 62(3), 237-242.
¹⁹Nieman, D.C., Henson, D.A., et al. (2007). *Medicine and Science in Sports and Exercise*, 39(9), 1561-1569.
²⁰Dabbagh-Bazarbachi, H., Clergeaud, G., et al. (2014). *Journal of Agricultural and Food Chemistry*, 62(32), 8085-8093.

NutraMedix 

KEEP OUT OF REACH OF CHILDREN

STORAGE: Keep tightly closed in a dry place at room temperature. (59-86°F or 15-30°C)

SUGGESTED USE: Take two capsules once daily after a meal or as directed by your physician. Do not use if pregnant or nursing. Stop use if adverse reactions develop.

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**SUPPORTS IMMUNE HEALTH AND
ZINC & VITAMIN C ABSORPTION †**



Dietary Supplement

120 Vegetable Capsules

Supplement Facts

Serving Size 2 Capsules
Servings Per Container 60

	Amount Per Serving	% DV
Quercetin (Sophora japonica Flower)	500 mg	

*Daily Value not established

Other Ingredients: Microcrystalline Cellulose, Vegetable Capsule, Di-Calcium Phosphate, Silicon Dioxide, Vegetable Magnesium Oxide

GLUTEN, SOY & DAIRY FREE

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