

Naringin – A Citrus Flavonoid That Reduces Heart Disease Risk

Analysis by [Dr. Joseph Mercola](#)

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STORY AT-A-GLANCE

- › Cardiovascular disease kills nearly 18 million people worldwide each year, but natural compounds like naringin in citrus fruits are showing strong protection for arteries and heart health
- › Naringin blocks ferroptosis, a deadly form of heart cell death during heart attacks, while silencing inflammation alarms to protect cardiac muscle under stress
- › Human trials show naringin improves cholesterol profiles, reduces arterial stiffness, and enhances overall cardiometabolic health within just 90 days of consistent intake from citrus sources
- › Beyond the heart, citrus flavonoids improve insulin sensitivity, lower harmful cholesterol, reduce belly fat, and stabilize blood sugar, offering metabolic benefits against obesity and diabetes
- › Naringin also protects the liver from drug-induced damage and slows tumor growth in cancers like breast, lung, and colon by restoring cell self-destruction and cutting tumor blood supply

Cardiovascular diseases (CVDs) are now the leading cause of death worldwide, and according to the World Health Organization (WHO), they're responsible for nearly 18 million deaths each year. These include conditions such as coronary artery disease and stroke, which are marked by restricted blood flow, oxidative stress, and chronic inflammation.

Making healthy lifestyle changes will help protect you against cardiovascular disease, and one important factor is your diet – particularly the nutrients you get from foods. For example, researchers are now looking into naringin, a natural compound found in citrus fruits, and how it helps improve cardiovascular health.

The Basics – What Is Naringin?

Naringin is a naturally occurring bioflavonoid that's particularly abundant in grapefruit, pomelo, and mandarin **oranges**. Classified as a flavanone glycoside, it is responsible for the distinct bitter taste in many citrus varieties.¹ Its discovery was credited to a French chemist called De Vry, who first isolated it in the mid-19th century.²

- **Naringin is not just a flavor compound** – It's a phytochemical with broad biological actions, ranging from antioxidant to anti-inflammatory effects.³ Naringin is composed of the flavanone naringenin linked to the sugar neohesperidose. Once ingested, it is metabolized by gut microflora into naringenin, which is the active form that exerts most of the physiological effects.

This conversion is key because the body relies on microbial enzymes to break down glycosides into compounds it can absorb and use efficiently. Without this process, the health benefits of naringin would be much less pronounced.⁴

- **Not all citrus fruits are high in naringin** – One study notes that grapefruit and pomelo have some of the highest sources; lime, however, has lower amounts of it. This compound is found in the pith, peel, seeds, and juice of the fruits.⁵
- **Naringin has been studied extensively for its pharmacological properties** – It interacts with multiple molecular pathways, including those involved in lipid metabolism, glucose regulation, and vascular function. This means naringin has an impact on both cardiovascular and metabolic health, making it a compound of interest for conditions driven by oxidative stress and chronic inflammation. As noted by one study:

*"Naringin is known for having anti-inflammatory, antioxidant, and tumor-fighting effects. Numerous test animals and cell lines have been used to correlate naringin exposure to asthma, hyperlipidemia, diabetes, cancer, hyperthyroidism, and osteoporosis."*⁶

Research Reveals How Naringin Supports Your Heart Health

A recent systematic review published in *Nutrients* investigated how naringin influences heart and blood vessel health. The researchers focused on how naringin affects endothelial function and inflammation markers, which play a direct role in cardiovascular disease progression.⁷

The study authors pooled data from various databases, such as Web of Science, PubMed, Embase, and Scopus to identify relevant articles published between January 2000 to June 2025. After coming up with 2,884 unique records, they narrowed it down to 62 studies – 28 in vitro, 29 animal, and five human studies.⁸

- **Some of the most promising results came from human data** – In one randomized controlled trial, adults who received naringin for 90 days showed significant improvements in cardiometabolic health, including healthier cholesterol profiles. Another human trial using naringin-rich grapefruit juice reported reduced arterial stiffness among the participants.
- **Naringin stops one of the deadliest forms of heart cell death during heart attacks** – One of the key findings from the research is that naringin blocks a process called ferroptosis. This is an iron-driven breakdown of cell membranes that quickly kills off cardiac muscle.

*"By preserving mitochondrial function (mitochondrial dysfunction is a hallmark of ferroptosis initiation) and reducing ROS [reactive oxygen species], naringin protected cells from lipid peroxidation and the iron-dependent demise characteristic of ferroptosis," the study authors noted.*⁹

- **It also silences inflammatory pathway that triggers further damage after a heart attack** – To put it simply, naringin helps your heart survive severe stress by preventing both runaway cell death and the chain reaction of inflammation that usually follows.
- **Naringin consistently stopped the activation of adhesion molecules** – Adhesion molecules act like Velcro, pulling in immune cells that spark inflammation and set the stage for arterial clogging. By turning down this process, naringin helped the blood vessels stay clear and functional, protecting your circulation at its foundation.
- **Naringin blunted both hypertrophy (the dangerous thickening of the heart muscle) and apoptosis (programmed cell death) in cardiac muscle cells** – These changes are usually driven by stress signals inside the cell, but naringin disrupted them by acting on certain pathways. Even under conditions simulating oxygen deprivation and reoxygenation – what happens during a heart attack – naringin preserved the mitochondria, which are the powerhouses of the cells.
- **In animal studies, naringin dramatically improves heart function and reduced tissue death** – The researchers found protective effects across multiple conditions, including diabetic heart damage, hypertension, and even sepsis-induced heart dysfunction. One study, for example, found that long-term naringin treatment reduced fatty plaque buildup inside arteries of cholesterol-fed rabbits.
- **The review also highlighted benefits in blood pressure control** – Naringin influences the renin-angiotensin system (RAS), a hormonal cascade that regulates blood pressure and fluid balance. By calming this system, naringin reduced high blood pressure and prevented cardiac remodeling – the unhealthy reshaping of the heart that often follows chronic high blood pressure that can lead to heart failure over time.

Overall, the findings reveal that naringin works through multiple biological mechanisms, which add up to a simple but powerful strategy: Keeping citrus bioflavonoids in your diet will give your heart the support it needs to resist damage, repair itself, and function more optimally.

"Considering the global burden of CVD and the pressing need for accessible, low-risk therapeutic options, further clinical investigation into the efficacy and safety of naringin is warranted," the researchers concluded.

"The evidence synthesized in this review provides a compelling rationale for such studies and underscores the potential of this citrus-derived flavonoid as a supportive agent in cardiovascular health promotion."¹⁰

Citrus Flavonoids Also Shows Measurable Benefits for Metabolic Health

According to a review published in the journal *Oxidative Medicine and Cellular Longevity*, citrus flavonoids like naringin also promote metabolic health.

- **The study didn't just focus on naringin** — It also highlighted other citrus flavonoids like rutin, nobiletin, diosmin, eriodictyol, and hesperidin. The paper drew on experimental findings from human, animal, and laboratory studies to identify how these compounds influence key systems that often go wrong in heart disease and diabetes.
- **One of the striking findings was how quickly some changes appeared** — In animal models of metabolic syndrome, flavonoid intake restored healthier lipid profiles, lowering triglycerides and harmful low-density lipoprotein (LDL) cholesterol while improving protective high-density lipoprotein (HDL) cholesterol.
- **Beyond cholesterol and fat metabolism, blood sugar control was another major benefit** — The review reported that citrus flavonoids improved insulin sensitivity, thereby lowering the risk of Type 2 diabetes. According to the research:

"[T]he effects of nobiletin were evaluated on the metabolism of glucose and insulin sensitivity in obese and diabetic ob/ob mice, where results have shown that 5-week treatment with nobiletin improved the circulating

glucose level, homeostasis model assessment (HOMA) index, and results of OGTT ...

We have also shown that hesperidin and naringin improved serum insulin, hepatic and muscle glycogen, and gene and protein expression of GLUT-4. In addition, both compounds ameliorated hepatic glucose output, peripheral glucose uptake, intestinal glucose absorption, and glucose-stimulated insulin secretion from isolated islets of Langerhans."

- **Citrus flavonoids also reduce overall body weight and abdominal fat** – These changes are practical because carrying less fat around the midsection directly reduces strain on your heart and lowers the likelihood of metabolic complications.
- **These vascular benefits and metabolic improvements were interconnected** – When arteries functioned better, blood sugar control improved, and when inflammation was reduced, cholesterol profiles improved. This highlights the holistic role of citrus flavonoids like naringin. They don't just act on one pathway but create a ripple effect that helps stabilize multiple systems at once. That's why the benefits extend across heart health, metabolism, and even energy balance.
- **Finally, the review showed that citrus flavonoids suppress NF-KB, the master switch for inflammation** – NF-KB drives the production of inflammatory cytokines, the chemical messengers that keep your immune system in a constant state of alarm. Shutting down this signal lowers chronic inflammation, protecting your arteries from damage and reducing the likelihood of plaque buildup.

The take-home message is that citrus flavonoids don't just help in one way. They simultaneously improve cholesterol, blood sugar, blood vessel function, and inflammation. For someone looking to protect their heart, regulate metabolism, and avoid diabetes, this makes citrus compounds a simple, natural way to keep multiple systems running smoothly.

Naringin Also Shows Strong Liver Protection and Anticancer Effects

Naringin also influences other areas of your health by defending your body against DNA damage, uncontrolled cell growth, and toxins that wear down your organs. In one review published in the journal *Molecules*, for example, researchers highlight how naringin protects against cancer and promotes liver health.¹¹

- **Naringin worked across multiple cancers, including breast, lung, and colon cancer** – It slowed the growth of tumor cells by stopping uncontrolled cell division and activating apoptosis. This is important because cancer develops when cells stop following these self-destruction signals. By restoring apoptosis, naringin helps eliminate dangerous cells before they multiply and spread.
- **The review also described how naringin reduced angiogenesis** – This is the formation of new blood vessels that tumors need to feed themselves. Basically, naringin starved tumor cells by cutting off their supply lines.
- **The liver-protective effects were just as compelling** – Naringin shielded the liver from chemical toxins, drug-induced damage, and metabolic stress. One animal study highlights how a combination of naringin and hesperidin was found to reverse drug-induced liver damage in rats. The researchers said:

"[W]hen hesperidin and naringin were given to diclofenac-injected rats, the raised levels of blood LDH, GGT, ALP, AST, IL-17 levels, total bilirubin, and TNF level, liver p53 and caspase-3 mRNA expression, liver lipid peroxidation all significantly decreased.

Through anti-inflammatory, antioxidant, and anti-apoptotic effects, hesperidin, naringin, and their combination proved effective for reversing diclofenac-induced liver damage. The liver adverse effects of medications like diclofenac can be treated with naringin, hesperidin, or a combination of the two."

When comparing anticancer and liver findings, the review made clear that both stem from similar biological actions: Reducing oxidative stress, calming chronic inflammation, and repairing mitochondrial health. These overlapping mechanisms show

why naringin is versatile; it strengthens core defense systems that protect you against cancer and liver degeneration simultaneously.

Simple Strategies to Protect Your Heart Health

Heart disease develops when your arteries get inflamed, your blood vessels stiffen, and your cells lose the ability to fight off stress. The research shows that compounds like naringin help reduce this damage, but your daily choices set the stage for how well your body uses these natural defenses. Here are some key steps to address the root causes of heart disease.

- 1. Cut out seed oils and ultraprocessed foods** — Your heart struggles most when it's overloaded with harmful fats, especially from seed oils loaded with **linoleic acid (LA)**. This omega-6 polyunsaturated fat (PUF) drives inflammation and oxidative stress, which is the very damage naringin helps fight. Replace seed oils with traditional fats like tallow, ghee, or grass fed butter. This shift reduces the constant fire inside your blood vessels and gives compounds like naringin a better chance to work.
- 2. Add citrus fruits rich in naringin to your diet** — Make fruits like grapefruit or pomelo a regular part of your meals. Even adding a few servings of citrus fruits a week will supply your body with the raw materials it needs to protect your heart cells.
- 3. Choose whole foods that work with, not against, naringin** — Swap junk meals for whole, unprocessed foods like fresh fruits, clean proteins, and nutrient-rich carbs like root vegetables. These foods give your body the minerals and antioxidants it needs to amplify the protective effects of naringin, making your arteries more elastic and your metabolism more stable.
- 4. Support your mitochondria with sunlight and movement** — If you spend most of your day indoors or sitting, your mitochondria become weaker, which makes your arteries less resilient. Step outside daily for sun exposure, especially at solar noon,

to recharge cellular energy. Pair this with regular movement like walking, which keeps blood flowing and boosts the same repair pathways that naringin activates.

However, remember that if you've been consuming a diet high in seed oils, you may need to avoid peak midday sun exposure to prevent the LA embedded in your skin from becoming oxidized. Ideally, eliminate LA from your diet for at least four to six months before going out under peak sunlight.

Consider also boosting your intake of pentadecanoic acid (C15:0), found in grass fed dairy to help clear LA from your skin faster. Read more in this article, "[The Fast-Track Path to Clearing Vegetable Oils from Your Skin.](#)"

- 5. Incorporate stress relief strategies** — If you often feel stressed, your blood pressure likely reflects it. Simple breathing exercises, better sleep, and even light stretching in the evening help ease stress and protect you from too much strain. Meditation, yoga, and [Emotional Freedom Techniques \(EFT\)](#) will also help ease stress and anxiety.

Frequently Asked Questions (FAQs) About Naringin and Heart Health

Q: What is naringin and where do you find it?

A: Naringin is a natural bioflavonoid that occurs in high amounts in citrus fruits like grapefruit, pomelo, and mandarin oranges. It is responsible for the bitter taste in these fruits. Once metabolized in your gut, it turns into naringenin, the active form that delivers powerful antioxidant, anti-inflammatory, and protective effects for your cardiovascular and metabolic systems.

Q: How does naringin protect heart health?

A: Naringin helps keep your arteries clear and flexible by repairing the delicate lining of blood vessels and lowering inflammation that leads to plaque buildup. Research shows it blocks ferroptosis, a destructive type of heart cell death during heart attacks, while also silencing the cGAS-STING pathway, a powerful inflammation alarm. Together, these actions help your heart withstand stress, prevent dangerous blockages, and improve long-term cardiovascular health.

Q: What benefits have human studies shown with naringin?

A: Clinical trials involving adults have shown that consistent intake of naringin, either directly or through grapefruit juice, improves cholesterol balance, reduces arterial stiffness, and enhances overall cardiometabolic health. In as little as 90 days, participants saw healthier lipid profiles and more flexible arteries, both of which directly reduce the risk of high blood pressure, heart attack, and stroke.

Q: Does naringin help beyond cardiovascular health?

A: Yes, naringin has broader benefits that go beyond the heart. It improves insulin sensitivity, lowers harmful LDL cholesterol, boosts protective HDL cholesterol, and reduces abdominal fat, all of which support better metabolic health. It also provides strong liver protection by reversing chemical and drug-induced damage and slows tumor growth in cancers such as breast, lung, and colon by restoring normal cell death processes and cutting off tumor blood supply.

Q: How can you add naringin to your daily routine?

A: Start by including naringin-rich fruits like grapefruit or pomelo in your meals several times a week. To give naringin the best chance to protect your heart, also cut seed oils and processed fats, focus on whole foods, and support your mitochondria

with daily sunlight and movement. Combining these steps with stress-relief practices like breathing exercises or light stretching will maximize the natural protective effects of naringin and improve your overall health.

Sources and References

- ^{1, 8} [News-Medical.net, August 18, 2025](#)
- ^{2, 7, 9, 10} [Nutrients 2025, 17\(16\), 2658](#)
- ^{3, 4, 5, 6, 11} [Molecules. 2023 Jul 25;28\(15\):5623](#)