

Aged garlic extract enhances production of nitric oxide. 2002 Jun 21;71 (5):509-17. doi: 10. 1016/s0024-3205 (02)01706-x. Nitric oxide (NO) controls several physiological functions of the cardiovascular system. Three kinds of NO synthases (NOSs), neuronal constitutive NOS (ncNOS), inducible NOS (iNOS) and endothelial constitutive NOS (ecNOS) .



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## **Garlic + Vitamin C increase Nitric Oxide? - Bodybuilding Forums**



**XTREME**

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# NITRIC OXIDE

DIETARY SUPPLEMENT

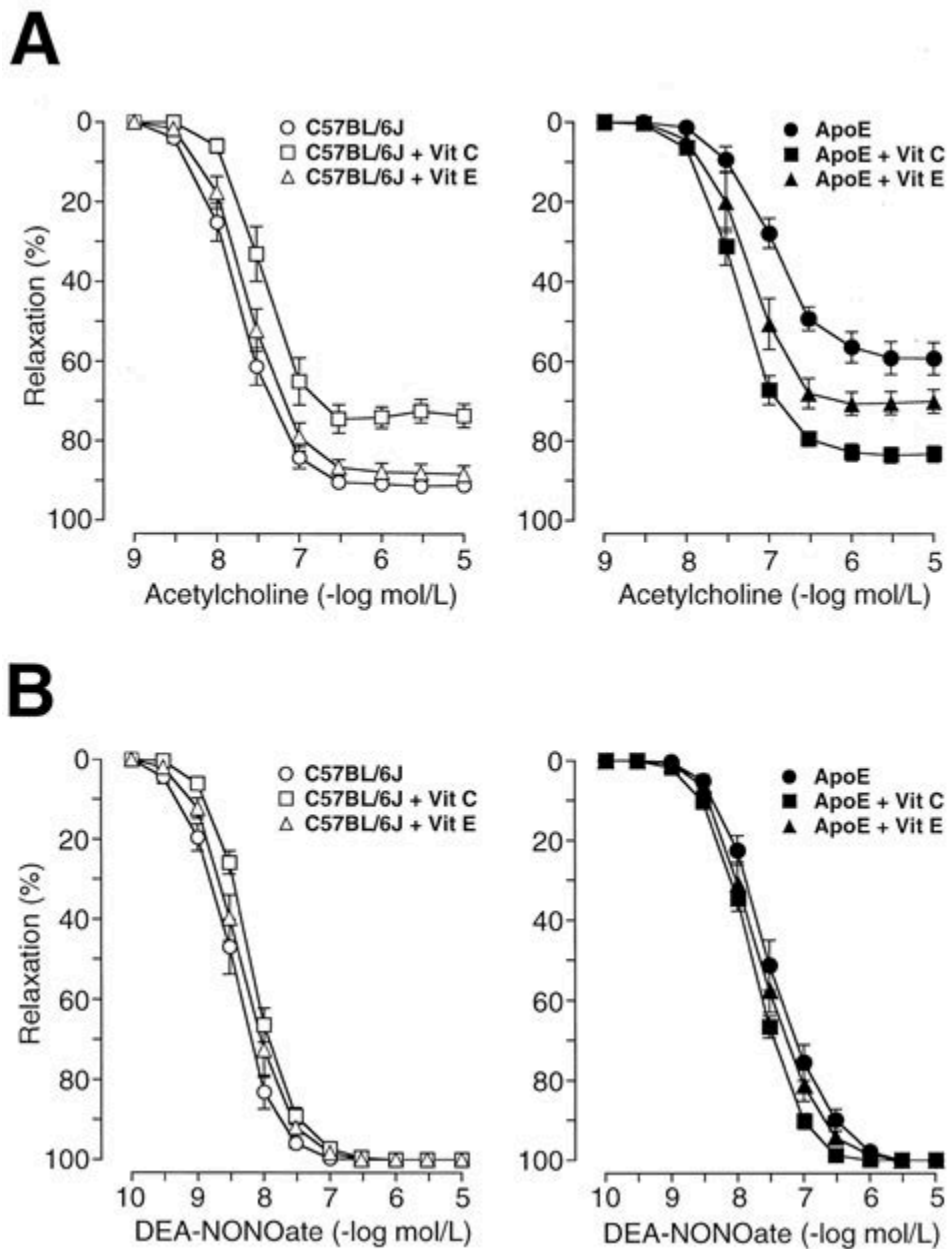
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Servings Per Container: 60  
  
L-Citrulline  
L-Arginine  
Agmatine  
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OTHER INGREDIENTS  
  
RECOMMENDED  
(2 capsules) with  
30 minutes prior to  
athletes & body  
workout. Do not  
Consume if you are  
the entire label.  
  
Consult with your healthcare provider.  
KEEP AWAY FROM CHILDREN

Aged or fermented garlic extract (FGE) is a natural remedy that improves vascular function through increasing vascular nitric oxide (NO) bioavailability. This is because nitrite ( $\text{NO}_2^-$ ), a NO metabolite, can be produced through bioconversion with macrobacteria during the fermentation of foods like garlic.

### Long-Term Vitamin C Treatment Increases Vascular Tetrahydrobiopterin .



In the current review, we focus on garlic and several other dietary supplements, such as coenzyme Q10, fish oil and probiotics, that have exhibited significant beneficial effects on blood pressure in clinical trials.

## Anti-angiogenesis efficacy of the garlic ingredient alliin and . - PubMed



Garlic can boost nitric oxide levels by activating nitric oxide synthase, the enzyme that aids in the conversion of nitric oxide from the amino acid L-arginine ( 10 ). One animal study.



# Effects of Fermented Garlic Extract Containing Nitric Oxide Metabolites .



Article

## Effects of Fermented Garlic Extract Containing Nitric Oxide Metabolites on Blood Flow in Healthy Participants: A Randomized Controlled Trial

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† These authors contributed equally to this work.

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**Abstract:** Aged or fermented garlic extract (FGE) is a natural remedy that improves vascular function through increasing vascular nitric oxide (NO) bioavailability. This is because nitrite (NO<sub>2</sub>), a NO metabolite, can be produced through bioconversion with macrobacteria during the fermentation of foods like garlic. We aimed to evaluate the effects of NO<sub>2</sub> in FGE on blood flow (BF), blood pressure (BP), velocity of the common carotid artery (CCA) and internal carotid artery (ICA), regional cerebral BF (rCBF), and peripheral BF (PBF). The study was divided into two parts: 1) Thirty healthy adults were divided into FGE and placebo groups to compare BP and velocity of the CCA and ICA; and 2) Twenty-eight healthy adults were divided into FGE and placebo groups to compare rCBF and PBF and determine changes before/after ingestion. Significant changes were noted in BP and the velocity of both CCA 30–60 min after FGE ingestion. FGE ingestion resulted in significant increases in rCBF and increases in body surface temperature through alterations in PBF. No detectable clinical side effects were noted. Overall, oral administration of NO<sub>2</sub>-containing FGE demonstrated acute positive effects in upregulating BF, including the CCA, BP, rCBF, and PBF. Follow-up studies with larger sample sizes and long-term ingestion may be needed.

**Keywords:** fermented garlic extract; blood flow; blood pressure; nitric oxide

### 1. Introduction

Cardiovascular disease (CVD) is the leading cause of mortality worldwide [1], and age is a major risk factor. CVD related mortality increases in older adults, due in large part to adverse changes occurring in arteries associated with vascular dysfunction. Age-related declines in cardiovascular functions may impair cerebral blood flow (BF) regulation, leading to the disruption of neuronal micro-environmental homeostasis [2]. As the brain requires a large amount of energy to sustain neuronal metabolism, cerebral BF is

The aim of this study was to assess the effects of vitamin C (ascorbic acid) on coronary flow and oxidative stress markers with or without non-specific inhibition of nitric oxide synthase by N( $\omega$ )-nitro-L-arginine monomethyl ester (L-NAME) in isolated rat hearts. The hearts of male Wistar albino rats ...

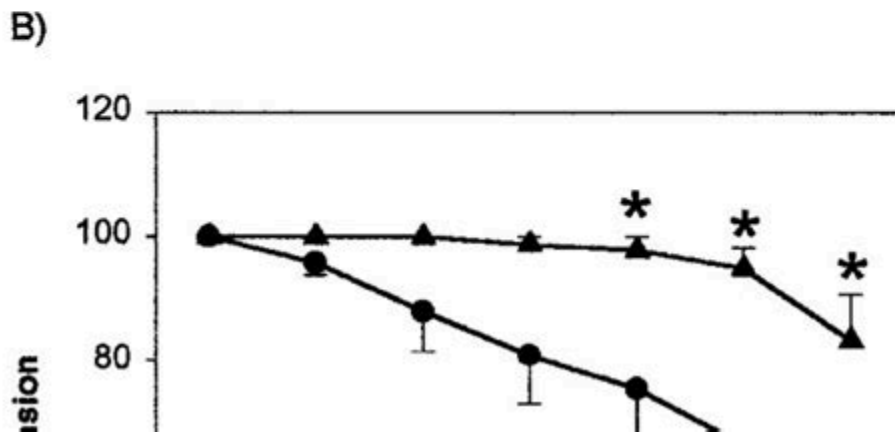
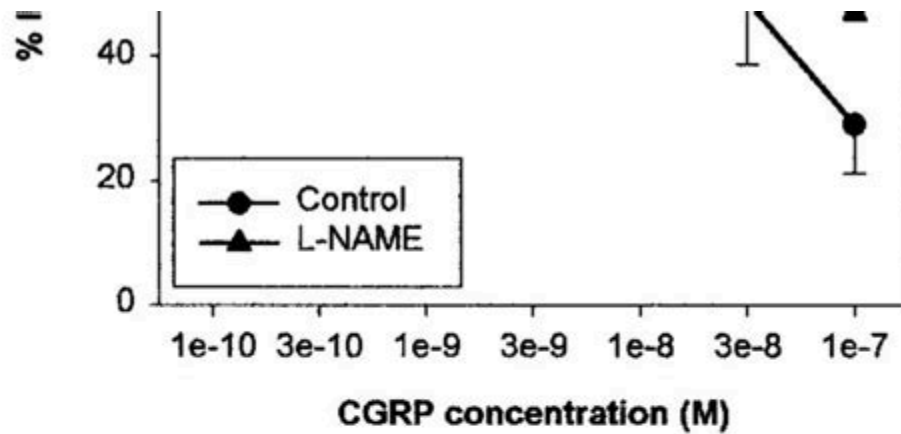
# 10 Healthy Foods to Boost Nitric Oxide and Why You Need It - WebMD



Vitamin C + Garlic Citrulline Arginine But creating the feeling of 'pump' before a workout isn't by far the only benefit of increasing nitric oxide levels: Boosting nitric oxide is extraordinarily good at

preventing cardiovascular disease, as it relaxes arterial walls, dilates the vessels and improves the flow of blood.

### The effects of vitamin C and nitric oxide synthase inhibition on .



Nitric oxide is produced by endothelial cells in response to various stimuli, which is scavenged rapidly ( $t_{1/2} = 4$  seconds). . Effect of garlic, vitamin C, or their combinations daily for 10 days on mean systolic blood pressure (BP) in subjects with marginally high BP. At day 10, the daily intake of the different agents was stopped and .



## **Vitamin C Foods & Their Shocking Boost to Nitric Oxide Levels**



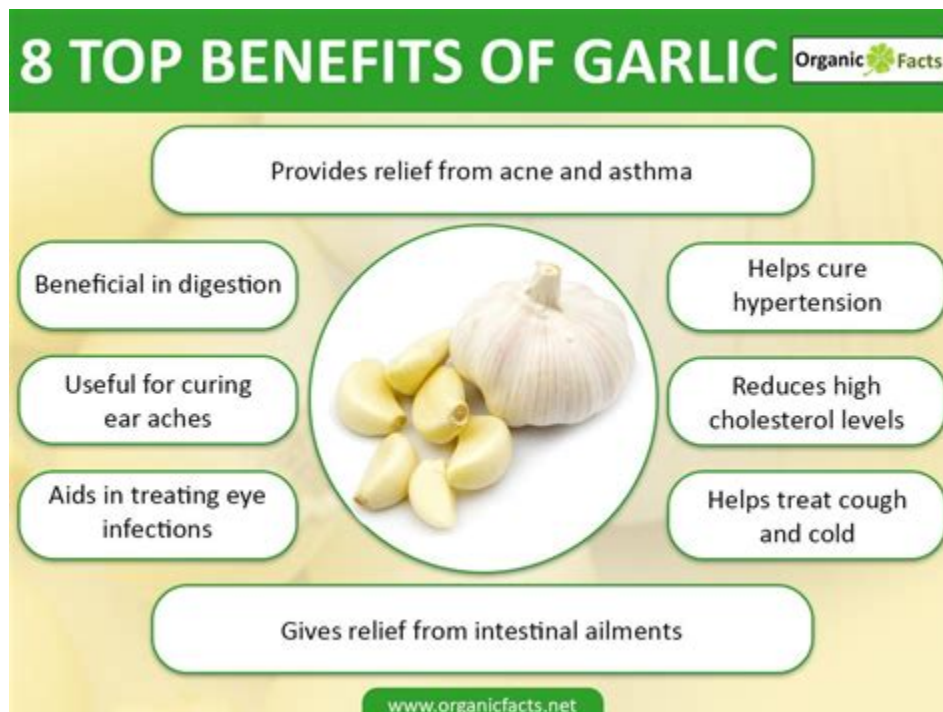
Does vitamin C enhance nitric oxide bioavailability in a tetrahydrobiopterin-dependent manner? In vitro, in vivo and clinical studies Ascorbate (Asc) has been shown to increase nitric oxide (NO) bioavailability and thereby improve endothelial function in patients showing signs of endothelial dysfunction.

### **5 Ways to Boost Nitric Oxide Levels Naturally For Better Circulation**



One of those roles is the boosted production of nitric oxide when paired with dietary nitrate.

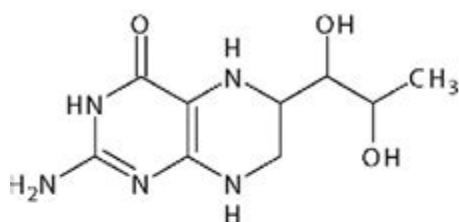
## Potential benefits of garlic and other dietary supplements for the .



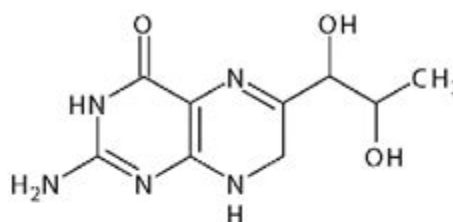
The present investigation was carried out to determine the in vivo effects of garlic and antioxidants on marginally high blood pressure in human subjects as well as the in vitro effects on human endothelial cell (EC) nitric oxide (NO) production. The antioxidant vitamin C alone (2.0 g/d), garlic alone (2.5 g/d), or a combination was administered for 10 days in human subjects with marginally .

## Does vitamin C enhance nitric oxide bioavailability in a .

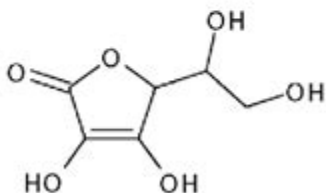
*A. Mortensen, J. Lykkesfeldt / Nitric Oxide 36 (2014) 51-57*



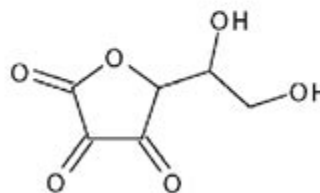
Tetrahydrobiopterin



Dihydrobiopterin



Ascorbic acid



Dehydroascorbic acid

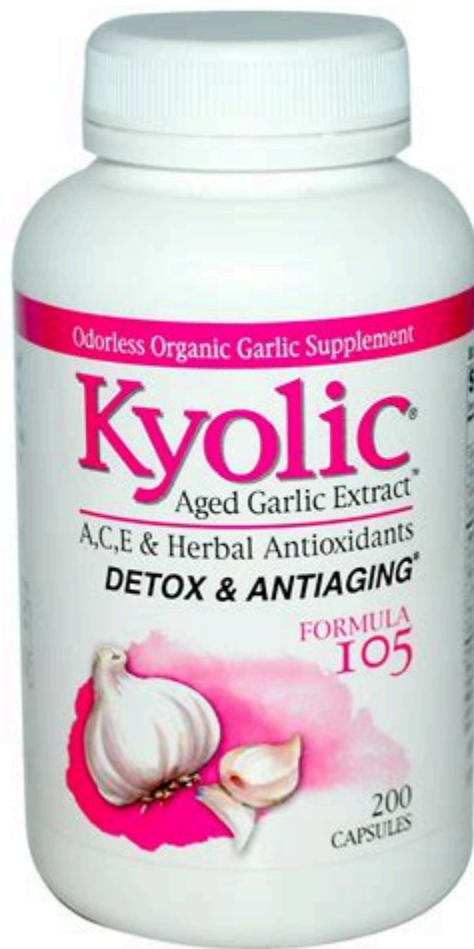
Alleviation of oxidative stress using antioxidants could decrease blood pressure and increase available nitric oxide (NO) in lead-induced hypertension. [6,7] Ascorbic acid (vitamin C) a water soluble vitamin that is one of the important antioxidants in plasma and cell membranes that could act as a free radical (specially superoxide anion).

### **Aged garlic extract reduces blood pressure in hypertensives: a . - Nature**



The authors of the study suggested that garlic and vitamin C increases production of nitric oxide by about 300% which positively affects the inner lining of blood vessel cell walls. Whether this data will be confirmed in a bigger study is yet to be determined.

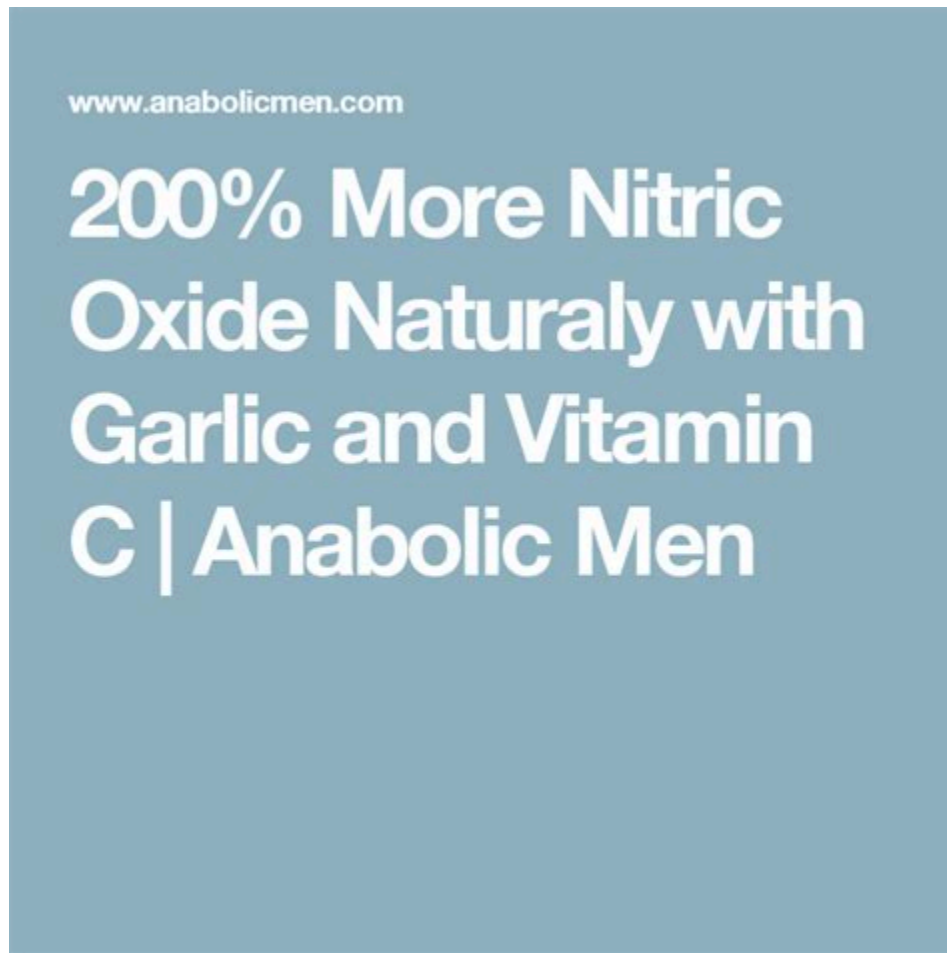
## Aged garlic extract enhances production of nitric oxide



The authors of the study suggested that garlic and vitamin C increases production of nitric oxide by about 300% which positively affects the inner lining of blood vessel cell walls. [www.epdyve.com/elsevier-anabolicmen/garlic-and-vitamin-c/](http://www.epdyve.com/elsevier-anabolicmen/garlic-and-vitamin-c/) Last edited by TheFugitive; 06-08-2018 at 09:58 AM



## 200% More Nitric Oxide with Garlic & Vitamin C - Anabolic Men



Your body needs to make nitric oxide out of component parts, which include vitamin C and nitrates. Without enough of these component parts, you will not be able to produce enough nitric.

### How to Increase Nitric Oxide Naturally: 5 Ways - Healthline





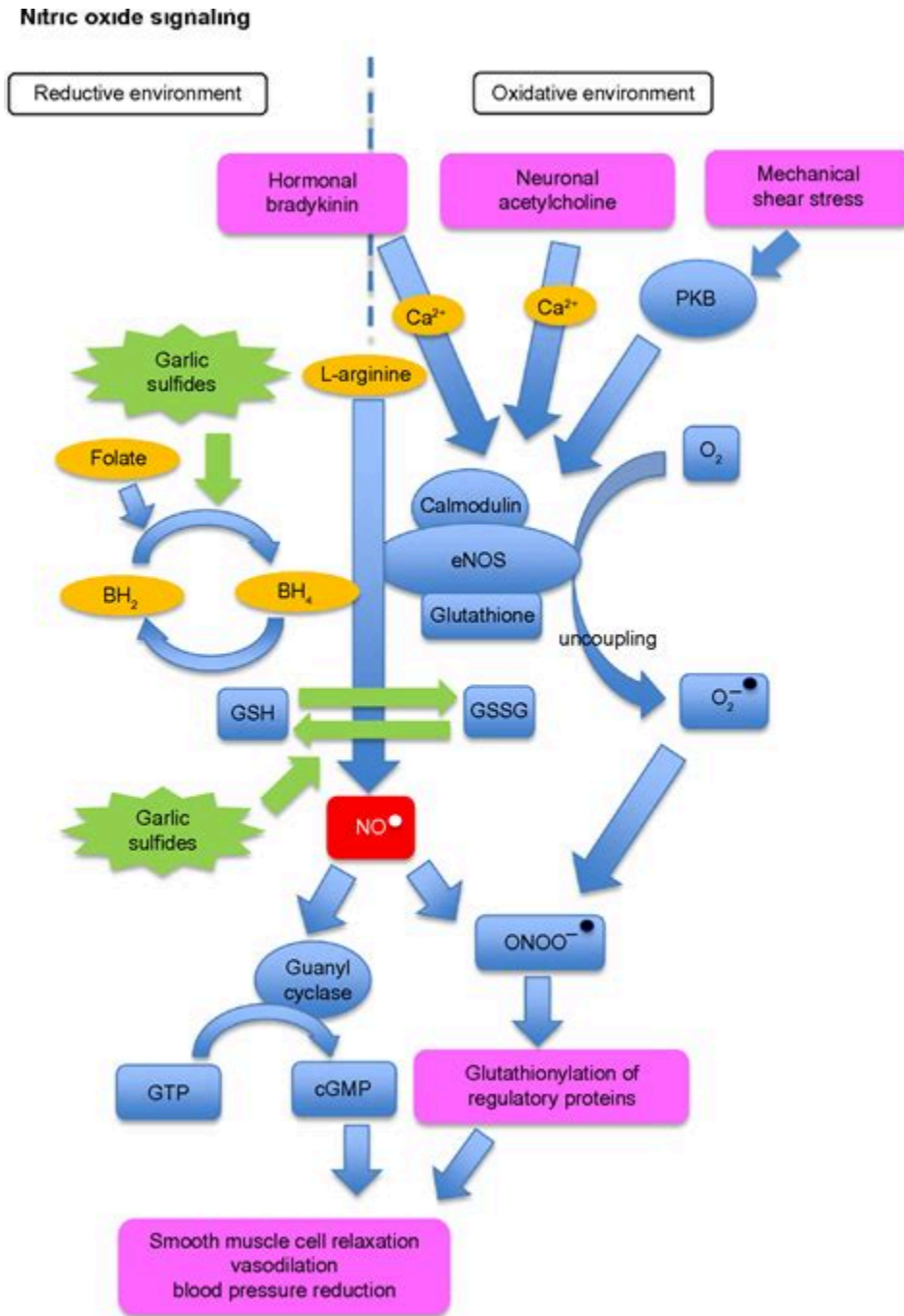
Citrus fruits. Citrus fruits such as lemons, limes, grapefruits, and oranges are all good sources of vitamin C, which has been shown to help your body absorb nitric oxide. Garlic. Like citrus fruits, garlic has been shown to boost the way that nitric oxide is absorbed. It activates nitric oxide synthase, an enzyme that helps convert the amino .

**For lower blood pressure, garlic and vitamin C work better together .**



A Combination of Vitamin C and Garlic It's a well-researched fact that vitamin C is good for your arteries, and it's also seen in multiple studies that garlic drops blood pressure levels quite nicely in human studies.

## Potential of garlic (*Allium sativum*) in lowering high blood pressure .



Here are 10 foods that are filled with healthy nitrates. 1. Celery. Celery is a bastion of healthy nitrates, transforming into nitric oxide in the body, which aids in vascular relaxation and blood .

## Garlic and Vitamin C increase Nitric Oxide Levels by 300%



Nitric oxide (NO) is a potent vasodilator and plays a key role in control of the cardiovascular system. 1 NO is mainly formed in endothelial cells from l-arginine by oxidation of its terminal guanidino-nitrogen,

2 requiring the cofactors NADPH, (6R)-5,6,7,8-tetrahydrobiopterin (BH<sub>4</sub>), FAD, FMN, heme, and Zn<sup>2+</sup>. 3,4 The formation of NO occurs via endothelial NO-synthase (eNOS) which is .

**10 foods that are filled with healthy nitrates - MSN**

# 10 Foods Naturally High In Nitrates

However, vegetables, which account for more than 80% of nitrate intake, contain antioxidants like vitamin C, which help prevent the formation of N-nitroso compounds ( 13, 14 ).



## Cellular effects of garlic supplements and antioxidant vitamins in .

### THE FULL LIST OF NUTRIENTS CONTAINED IN BLACK GARLIC

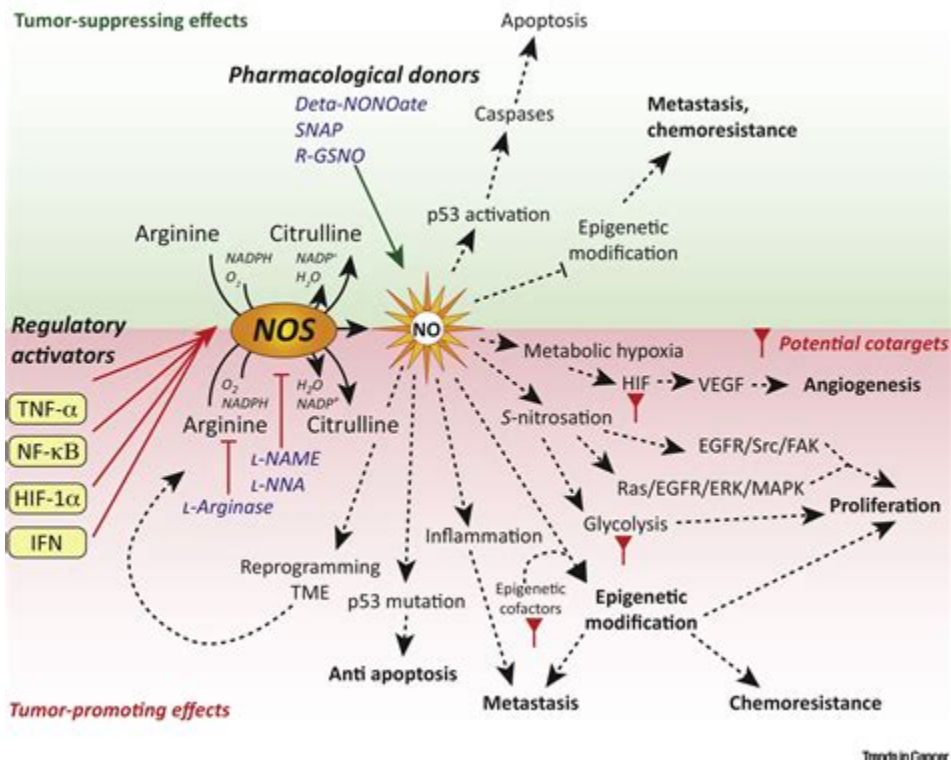
- VITAMINS**
  - VITAMIN C
  - B VITAMINS (B1, B2, B3, B6, B9)
  - VITAMIN D
- MINERALS**
  - IRON
  - ZINC
  - FOLATE
  - CALCIUM
  - SILICON
  - SODIUM
  - POTASSIUM
  - SELENIUM
  - MANGANESE
  - MAGNESIUM
  - PHOSPHOROUS
- ANTIOXIDANTS**
  - TETRAHYDRO-BETA-CARBOLINES
  - SELENIUM
  - N-FRUCTOSYL GLUTAMATE
  - N-FRUCTOSYL ARGININE
  - NA (1-DEOXY-D-FRUCTOS-1-YL)-L-ARGININE
- WATER SOLUBLE ORGANOSULFUR COMPOUNDS**
  - S-ALLYL-CYSTEINE (SAC)
  - S-ALLYLMERCAPTOCYSTEINE (SAMC)
- LIPID SOLUBLE ORGANOSULFUR COMPOUNDS**
  - DIALLYL SULFIDE
  - TRIALLYL SULFIDE
  - DIALLYL POLYSULFIDE
  - DIALLYL DISULFIDE

FIND OUT MORE IN ECOSH.COM BLOG [www.Ecosh.com](http://www.Ecosh.com)

The antihypertensive properties of garlic have been linked to stimulation of intracellular nitric oxide and . and vitamin B12. 26, 27. Other minor side effects were reported by a third (32%) of .



## Effect of ascorbic acid supplementation on nitric oxide metabolites and .



Garlic and hypertension. Garlic (*Allium sativum*) has been used as a spice, food, and medicine for over 5,000 years, and is one of the earliest documented herbs utilized for the maintenance of health and treatment of disease. 42 In some of the oldest texts on medicine, eg, the Egyptian Ebers papyrus dating around 1500 BC and the sacred books of India, "the Vedas" (1200-200 BCE), garlic was .

## Foods That Boost Nitric Oxide Levels | The Well by Northwell



Taking garlic supplements alone caused a twofold increase in cellular nitric oxide production, they said. But combining garlic and vitamin C resulted in a threefold increase. An estimated 72 million Americans



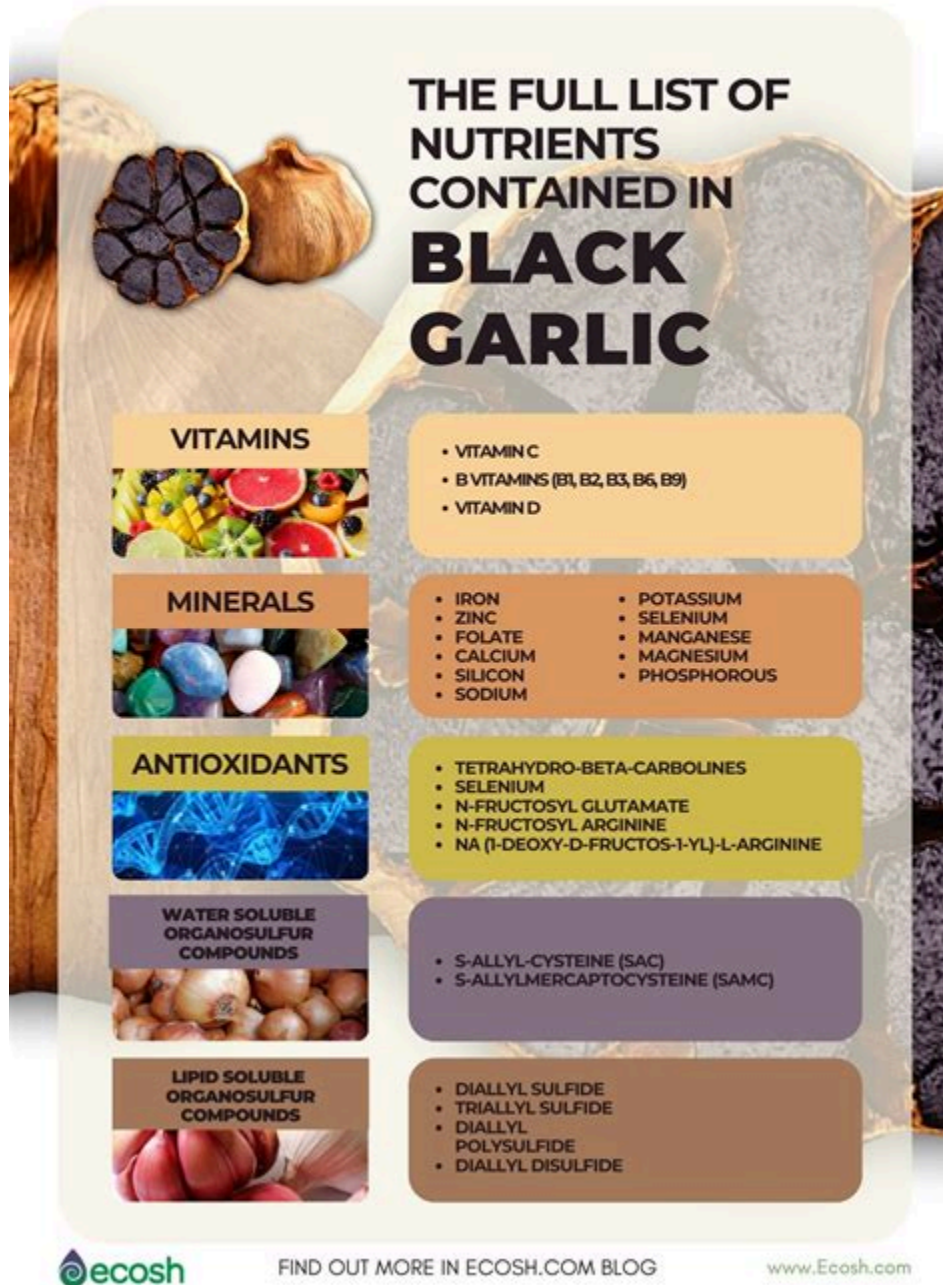
older than 20 (1 in 3 adults) have high blood pressure, the number-one changeable risk factor for stroke.

## The 10 Best Foods to Boost Nitric Oxide Levels - Healthline




The antioxidant vitamins C and E significantly ( $P < 0.001$ ) enhanced the inhibitory efficacy of alliin on FGF2-induced EC tube formation and angiogenesis. Alliin significantly increased ( $P < 0.01$ ) nitric oxide (NO) release into the CAM fluid, which was further enhanced by vitamins C and E.

## Cellular effects of garlic supplements and antioxidant vitamins in .



**THE FULL LIST OF NUTRIENTS CONTAINED IN BLACK GARLIC**

- VITAMINS**
  - VITAMIN C
  - B VITAMINS (B1, B2, B3, B6, B9)
  - VITAMIN D
- MINERALS**
  - IRON
  - ZINC
  - FOLATE
  - CALCIUM
  - SILICON
  - SODIUM
  - POTASSIUM
  - SELENIUM
  - MANGANESE
  - MAGNESIUM
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  - DIALLYL POLYSULFIDE
  - DIALLYL DISULFIDE

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Garlic (*Allium sativum* L. ) is thought to have a variety of therapeutic applications including inhibition of platelet aggregation. Many of the therapeutic actions of garlic parallel the physiological effects of nitric oxide and may be explained by its ability to increase nitric oxide synthase activit ...

- <https://publiclab.org/notes/print/45757>

- <https://publiclab.org/notes/print/43057>
- <https://publiclab.org/notes/print/43331>