

# Pomegranate Power: Why Pom Extract Belongs in Sports Supplements

written by PricePLOW Staff | February 3, 2023

*"Eat your fruits and vegetables!"*

How many times have you heard *that*?

We all know that we *should* eat healthy vegetables. But oftentimes, life gets in the way, and for one reason or another, eating junk food is a lot more convenient.

So when you *do* happen to have your fresh produce game on point, the question then is: What *specifically* should you eat?



Pomegranate is a nutritional powerhouse, and is drastically underutilized in athletic supplements. Primeval Labs is showing the pomegranate way by including pom extract in their nitric oxide supplement.

Because, as it turns out, not all fruits and vegetables are created equal. Some do a lot *more* for your health than others.

And in our opinion, **pomegranate** is one of the world's nutritional superstars.

## How Pomegranate Adds to Ape Sh\*t Pumps

A little while back, we covered **Ape Sh\*t Pumps** from **Primeval Labs**. If you need a refresher, check out our long-form article, *Primeval Labs Ape Sh\*t PUMPS: Pomegranate Powered Pumps*.

This is a cool stimulant-free pre-workout formula – it's short but *focused* with some pretty nice synergy between citrulline and agmatine sulfate, which increase

nitric oxide (NO) blood levels by complementary mechanisms.

What makes it *unique*, though, is the inclusion of *pomegranate*, which is, unbeknownst to most, a potent *NO booster* in its own right. In fact, there are *plenty* of benefits associated with regular pomegranate consumption – benefits we think athletes and gym-goers would be quite interested to hear about.

So today, let's talk about *pomegranate*, and why you might want to take a pomegranate-containing pre-workout like Primeval Labs' Pump formula. But first, check the PriceFlow deals and news:

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## What is Pomegranate?



Also known as *Punica granatum*, pomegranate is a shrub that grows between 15 and 35 feet tall, bearing a unique fruit with juicy seeds. It was originally discovered in the Mediterranean, but brought to the Americas in the 1500s and eventually into California in the 1700s.

The seeds of the fruit are embedded in a "seedcoat" known as a *sarcotesta*, which

also contains juice but is generally inedible. Technically, the fruit can be considered a *berry*, but is larger than other berries – it's generally the size of a very large apple, but not as big as a grapefruit.

Juice from the mature fruits' seeds can be squeezed through compression, yielding a very red color due to the *anthocyanins* and *ellagitannins* inside. These are what provide many of the health benefits we'll describe next.

## The benefits of Pomegranate

### • Antioxidant compounds in Pomegranate

The first thing to know about pomegranate is that it's absolutely *loaded* with antioxidant compounds.

Antioxidants play a crucial role in human physiology and, *in general*, they're a big part of the reason why we're constantly admonished to eat our fruits and vegetables in the first place.

Here's what one study has to say on the subject:

*Moreover, substantial experimental studies have supported the protective role of fruits against CVDs, and several fruits (grape, blueberry, **pomegranate**, apple, hawthorn, and avocado) have been widely studied and have shown potent cardiovascular protective action. Fruits can prevent CVDs or facilitate the restoration of morphology and functions of heart and vessels after injury. The involved mechanisms included protecting vascular endothelial function, regulating lipids metabolism, modulating blood pressure, inhibiting platelets function, alleviating ischemia/reperfusion injury, suppressing thrombosis, **reducing oxidative stress, and attenuating inflammation.**[1]*

The incredible *restorative potential* of fruits and vegetables is where the belief that *food can be medicine* originates.

The specific *antioxidant* and *anti-inflammatory* compounds in pomegranate fruit are *many*, but some of the more important ones are **flavonoids, anthocyanins, puniic acid**, and **ellagitannins**. [2] Cleaned white seeds consist of about 18% oil, 65% of which is *puniic acid*, one of the key constituents. [2]

## Anthocyanins

If you take a look at the fruits that are often described as “superfoods,” you’ll notice an interesting pattern. Most of them are *red*, *blue*, or *purple* in color –examples include blueberries, raspberries, acai berries, and *pomegranate*.



Research shows that beyond its nitric oxide boosting effects, natural pomegranate juice greatly enhances performance and recovery, while also reducing markers of muscle damage (soreness).

The thing they all have in common is a high *anthocyanin content*. As it turns out, anthocyanins are *pigmented* phenolic antioxidants responsible for the *color of certain* fruits and vegetables.

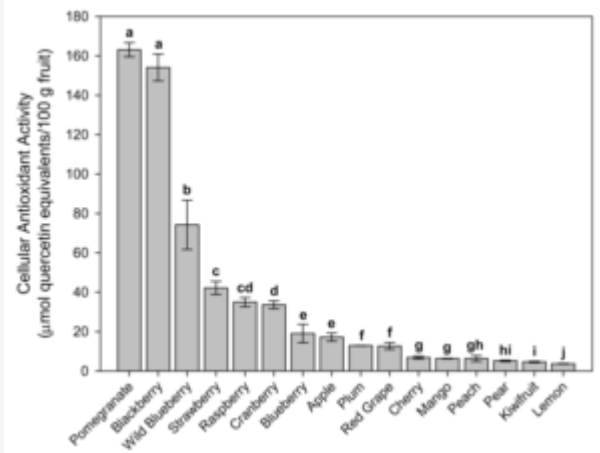
So when it comes to pomegranate, yes, the *anthocyanins* are what make it *red*. [3]

If you’ve hung around ancestral health circles, you’ve probably heard the theory that *fruits want to be eaten*. This is because they contain *seeds that* herbivores eat, digest, then eliminate and pass into the ground. This is called *seed dispersion*, and it’s a crucial part of many plants’ life cycles.

Researchers speculate that the bright colors imbued by anthocyanins may have evolved to *attract the attention* of herbivorous animals, which in this context are called *seed dispersers*. [4]

Following this line of reasoning, we might expect that fruits not only *attract* seed dispersers, but also *reward* them in the form of easily digestible energy and better health. When it comes to *humans*, that’s pretty much exactly what the research on anthocyanin consumption shows.

•



Pomegranates have the greatest cellular antioxidant activity of the 25 fruits tested![5]

For one thing, anthocyanins are *incredibly* potent antioxidants.[6] In fact, in one study that examined the antioxidant properties of 25 commonly consumed fruits, *pomegranate* was found to have the highest *cellular antioxidant capacity*. [5]

No doubt this is largely thanks to its high *anthocyanin* content – the *next four highest* fruits were blackberry, wild blueberry, strawberry, and raspberry, [5]. Like pomegranates, they’re colored by deep red and blue hues. Similarly, Pom also scores quite high in ORAC (oxygen radical absorbance capacity), coming after other berries in strength. [5]

### 1. Antibacterial

Anthocyanins aren’t just antioxidants, though! They also have significant *antimicrobial* effects. In fact, they attack *bacterial reproduction* in so many different ways, it’s easy to think anthocyanins were *designed* as antibiotics.

Anthocyanin compounds break up *bacterial cellular membranes*, block their mitochondrial respiration, and block enzyme activity that microbes need to survive. [6] They also destroy substrates that pathogenic bacteria use to manufacture their own food. [6]



For a more stimulating pre-workout, check out Primeval Labs ApeSh\*t Max.

According to one 2013 research review on the subject, pomegranates and pomegranate extracts *both* demonstrated *significant* antimicrobial activity against *Helicobacter pylori* (*H. pylori*),[7] the species of bacteria that's now believed to contribute to the onset of stomach ulcers, gastritis, and even certain forms of *cancer*. [8]

## 2. Anti-inflammatory

Antioxidant and anti-inflammatory effects usually go hand-in-hand, since oxidative stress is a major contributing factor to systemic inflammation. Correspondingly, *antioxidant* compounds are also *usually* anti-inflammatory.

The anti-inflammatory effects of anthocyanins go *beyond* their antioxidant capacity, though. Anthocyanins have been shown to actually inhibit the production of *prostaglandins*, which are important *precursors* to inflammatory cytokines. [6]

You've no doubt heard of *aspirin*, a famous anti-inflammatory drug. Well, *prostaglandin inhibition* is aspirin's primary mechanism of action! And, believe it or not, one study found that *anthocyanins* are actually *better* than aspirin at decreasing inflammation! [9]

Studies with pomegranate juice show significant anti-inflammatory effects in those who take it, thanks, in no small part, to its high concentration of anthocyanins. [10,11]

### 3. Anti-diabetic

Anthocyanins also have benefits for *insulin* and *glucose* metabolism.

They upregulate a hormone called *adiponectin*, which makes your body *insulin sensitive* and increases *glucose uptake* in muscles.[6]

Possibly as a result, anthocyanin supplementation can decrease *adipocyte inflammation*. Both *adipocyte inflammation* and low levels of *adiponectin* have been linked to diabetes and obesity.[12]

#### • Ellagitannins (including *punicalagin*)

Another powerful type of antioxidant in pomegranate is **punicalagin**, a class of *tannin*.

In fact, punicalagin is the most abundant type of antioxidant found in the arils (seed pods) of the pomegranate fruit, and is responsible for about *50% of its total antioxidant activity*. [13]



In one study from 2017, researchers injected *mice* with *tumor necrosis factor alpha* (TNF- $\alpha$ ), an inflammatory cytokine that can cause muscle wasting. They wanted to see whether pomegranate extract would prevent TNF- $\alpha$ -induced damage to the muscles of the mice – and amazingly, it did.[14]

When researchers analyzed the mice's blood looking for pomegranate extract metabolites, the only one that they found in significant quantities was *uro lithin A*, which is a metabolite of punicalagin.[14]

**Urolithin A** is a pretty amazing molecule. It's been shown to have profound

*anti-inflammatory effects*, as it inhibits the *cyclooxygenase-2* (COX-2) enzyme, which is the same mechanism of action behind the efficacy of *aspirin*. [15]

But perhaps most impressively, urolithin A induces *mitophagy*, a process in which the body selectively breaks down and recycles *damaged or dysfunctional mitochondria*, replacing them with *new, healthy mitochondria*. [15]

Mitochondrial function is *unbelievably important* for good health, and we harp on it a lot here at the PricePLOW Blog.

So, when you take pomegranate, you'll be getting a nice dose of punicalagin and hence, urolithin A. Your mitochondria will probably thank you.

- **Flavonoids**

There's actually a *lot* of overlap between the effects of *flavonoids* and anthocyanins.

Flavonoids are *phenolic antioxidants* that have been shown to possess cardioprotective, neuroprotective, anti-inflammatory, and antimicrobial properties. [16]

We won't dwell too much on these, because lots of fruits and vegetables have flavonoids. They're also discussed a *lot* in the nutrition blogosphere. And, in our opinion, the high concentration of anthocyanins and punicalagin are what make pomegranate stand out from the rest.

- **Pomegranate Research**

It's all well and good to discuss isolated bioactive constituents in a supplement.

But what about when the rubber meets the road? Does the performance of pomegranate juice, extracts, and arils live up to the promise of the anthocyanins, punicalagin and flavonoids the fruit contains?

- **Exercise performance**

In one 2014 study, researchers randomly assigned 19 men and women, with an average age of 22, to receive either 1,000 milligrams of pomegranate extract or a placebo.





Choose your flavor, then get some ape-like pumps

The volunteers' average  $\text{VO}_2\text{max}$  was  $51.3 \pm 9.4$  ml/kg/min, which is significantly above average for both men and women. In other words, these were very fit people – trained at the time of the study, and probably also with an extensive athletic history.

The researchers took their running speed at maximal oxygen consumption using a treadmill test, and then had the participants complete another test 1 to 2 days later. Only this time, the subjects took their prescribed treatment 30 minutes before the test.

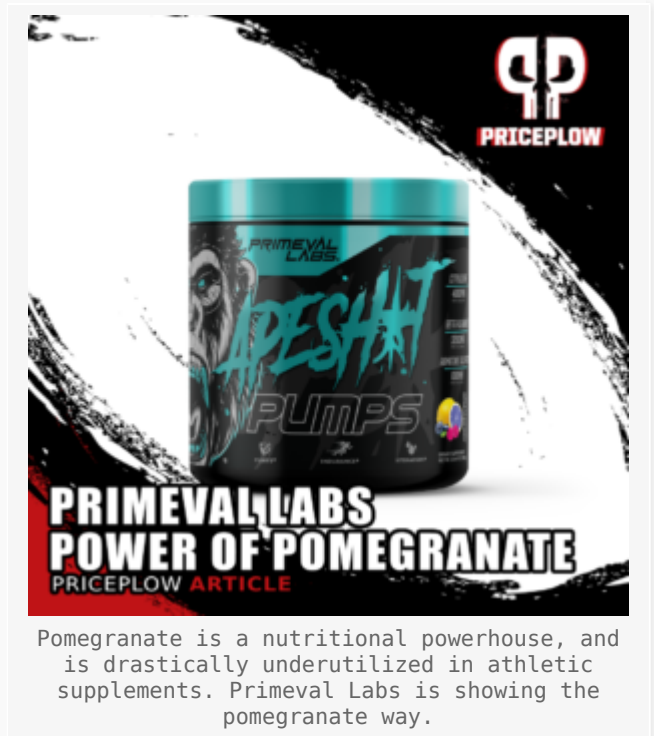
The results were striking. At 90%  $\text{VO}_2\text{max}$ , the PE increased subjects' *time to exhaustion* by about 12%.

At 100%  $\text{VO}_2\text{max}$ , the benefit was less impressive, but still significant. The PE-treated subjects lasted about 7% *longer*. [17]

- **Nitric oxide (NO) production**

The authors of the treadmill study pointed out that PE's ability to *increase NO production* was probably a big part of the reason it boosted athletic endurance. [17]

Pomegranate has been shown to *protect NO from oxidation* [18] – this mechanism usually boosts NO blood levels quite a bit – since NO is a notoriously unstable molecule and particularly prone to being degraded through oxidation.



But pomegranate is also rich in *nitrates*, which are a necessary component of NO production,[18] meaning it can *boost NO production*.

In one *study*, administering *pomegranate juice* to mice with high cholesterol significantly reduced the development of plaque in their arteries – largely due to the increase in *NO activity* that the treatment caused.[19]

- **Mitochondrial function**

So if urolithin A can improve mitochondrial health, does a full-spectrum pomegranate extract do the same? The answer appears to be *yes* – research has shown that *pomegranate extract* (PE) can significantly improve mitochondrial function.[20]

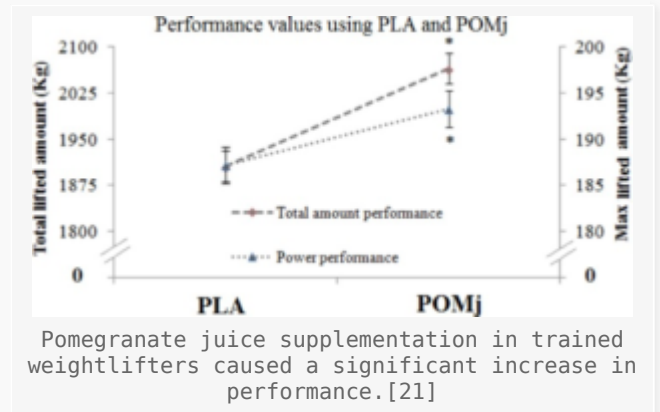
In this study, *rats with high blood pressure* were given PE, and it significantly reduced their blood pressure and improved their cardiovascular function.

The study authors point out, "*pomegranate extract alleviates hypertension-induced reduction of mitochondrial biogenesis*,"[20] and that this is key to its cardioprotective effect.

The connection between mitochondrial function and cardiovascular might not *immediately* make sense to some readers, but we've actually written about it in our article on exogenous ATP supplements late last year. We went into pretty extensive detail about how increased *ATP production* in the mitochondria can actually improve blood flow.

## • Inflammation

Studies on pomegranate juice show significant anti-inflammatory effects in those who take it, thanks, in no small part, to its high concentration of anthocyanins.[10,11]



In one *randomized, double-blind, placebo-controlled* study, *diabetics* who drank pomegranate juice experienced *significant reductions* in *interleukin-6* (IL-6) blood levels, an inflammatory cytokine and *C-reactive protein* (CRP), the latter of which is used widely as a measure of *whole-body inflammation*. [10]

## • Recovery from exercise

Here's a concern that's probably significant for most of our readers – whether pomegranate can *improve recovery from exercise*, particularly *weightlifting*, where recovery is necessary for gaining muscle mass.

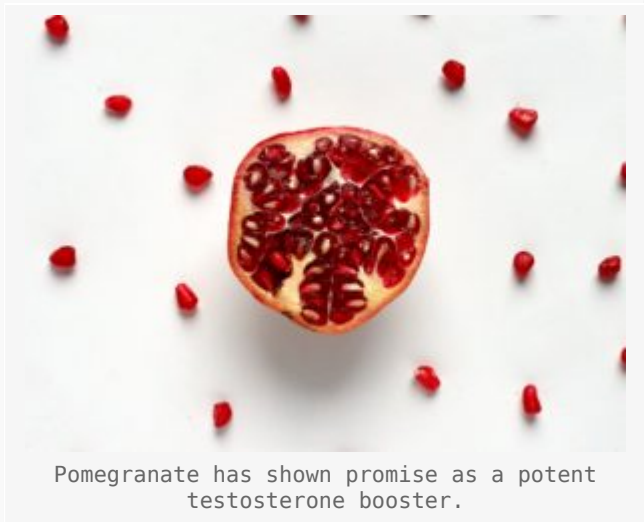
A study of *nine elite weightlifters* found that pom juice could significantly reduce muscle soreness and blood pressure following an Olympic lifting session.[21] It also improved their *total volume performance* by about 8%.

*Pomegranate juice supplementation in trained weightlifters caused a significant increase in performance.*[21]

## • Pomegranate: A unique testosterone booster?

Where pomegranate *really* shines is as a *testosterone booster*. In fact, it's one of the most powerful, if not *the* most powerful, non-pharmaceutical testosterone boosters available.

Take this 2015 study in which men *and* women consumed *half a liter* (about 2 cups) of pomegranate juice daily.



After *two weeks of supplementation* with the juice, the men experienced a *24% increase in salivary testosterone levels*. [22]

That's *enormous*. We rarely, if ever, see effect sizes that large from testosterone-boosting compounds.

It also *significantly* reduced cortisol levels – *morning* cortisol was down by *about 50%*, whereas midday cortisol was down by about 25%. [22]

This matters a lot for hormone health because, as most of our bro-scientist readers know, cortisol opposes the effects of testosterone.

We can't dismiss this astonishing result as a one-off, either, because a 2008 *rat study* found pretty much the same thing – a roughly 24% increase in testosterone! [23]

Pomegranate exerts these pro-androgenic effects primarily by reducing oxidative stress in the testes. [22,23] The *rat study* actually observed that pomegranate juice supplementation *significantly increased the testicular weight* of rats in the experimental group. [23]

## Conclusion

So there you have it – as usual, this is just the tip of the iceberg. We didn't even get into the *neuroprotective effects* of pomegranate and its bioactive constituents, because, well, it's not the most relevant thing in the world for Ape Sh\*t Pumps.

If you're curious and want to learn more about the power of this incredible fruit, there's plenty more research out there to peruse. Just know that this isn't just a great health ingredient – it's a great *sports nutrition* ingredient,

and we love seeing it in pump supplements!

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## References

1. Zhao, Cai-Ning et al. "Fruits for Prevention and Treatment of Cardiovascular Diseases." *Nutrients* vol. 9,6 598. 13 Jun. 2017, doi:10.3390/nu9060598 <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5490577/>
2. Zarfeshany, Aida et al. "Potent health effects of pomegranate." *Advanced biomedical research* vol. 3 100. 25 Mar. 2014, doi:10.4103/2277-9175.129371 <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4007340/>
3. Ben-Simhon, Zohar et al. "A "White" Anthocyanin-less Pomegranate (*Punica granatum* L.) Caused by an Insertion in the Coding Region of the Leucoanthocyanidin Dioxygenase (LDOX; ANS) Gene." *PLoS one* vol. 10,11 e0142777. 18 Nov. 2015, doi:10.1371/journal.pone.0142777 <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4651307/>
4. Liu, Ying et al. "Anthocyanin Biosynthesis and Degradation Mechanisms in Solanaceous Vegetables: A Review." *Frontiers in chemistry* vol. 6 52. 9 Mar. 2018, doi:10.3389/fchem.2018.00052 <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5855062/>
5. Wolfe, Kelly L et al. "Cellular antioxidant activity of common fruits." *Journal of agricultural and food chemistry* vol. 56,18 (2008): 8418-26. doi:10.1021/jf801381y <https://pubs.acs.org/doi/10.1021/jf801381y>
6. Pojer, E., Mattivi, F., Johnson, D. and Stockley, C.S. (2013), *The Case for Anthocyanin Consumption to Promote Human Health: A Review. Comprehensive Reviews in Food Science and Food Safety*, 12: 483-508. <https://doi.org/10.1111/1541-4337.12024> <https://ift.onlinelibrary.wiley.com/doi/10.1111/1541-4337.12024>
7. Howell, Amy B, and Doris H D'Souza. "The pomegranate: effects on bacteria and viruses that influence human health." *Evidence-based complementary and alternative medicine : eCAM* vol. 2013 (2013): 606212. doi:10.1155/2013/606212 <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3671682/>
8. Kamboj, Amrit K., et al. "Helicobacter Pylori." *Mayo Clinic Proceedings*, vol. 92, no. 4, Apr. 2017, pp. 599–604, 10.1016/j.mayocp.2016.11.017. Accessed 2 July 2020. [https://www.mayoclinicproceedings.org/article/S0025-6196\(17\)30068-X/fulltext#relatedArticles](https://www.mayoclinicproceedings.org/article/S0025-6196(17)30068-X/fulltext#relatedArticles)
9. Wang H, Nair MG, Strasburg GM, Chang YC, Booren AM, Gray JI, DeWitt DL. Antioxidant and antiinflammatory activities of anthocyanins and their aglycon, cyanidin, from tart cherries. *J Nat Prod*. 1999 Feb;62(2):294-6. doi: 10.1021/np980501m. Erratum in: *J Nat Prod* 1999 May;62(5):802. PMID: 10075763. <https://pubmed.ncbi.nlm.nih.gov/10075763/>
10. Sohrab, Golbon et al. "Effects of pomegranate juice consumption on inflammatory markers in patients with type 2 diabetes: A randomized, placebo-controlled trial." *Journal of research in medical sciences : the official journal of Isfahan University of Medical Sciences* vol. 19,3 (2014): 215-20. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4061642/>
11. Danesi, Francesca, and Lynnette R Ferguson. "Could Pomegranate Juice Help in the Control of

- Inflammatory Diseases?." *Nutrients* vol. 9,9 958. 30 Aug. 2017, doi:10.3390/nu9090958  
<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5622718/>
12. Tsuda T. Regulation of adipocyte function by anthocyanins; possibility of preventing the metabolic syndrome. *J Agric Food Chem.* 2008 Feb 13;56(3):642-6. doi: 10.1021/jf073113b. Epub 2008 Jan 23. PMID: 18211021. <https://pubmed.ncbi.nlm.nih.gov/18211021/>
  13. "Punicalagin – an Overview"; *ScienceDirect Topics*;  
<https://www.sciencedirect.com/topics/biochemistry-genetics-and-molecular-biology/punicalagin>
  14. Rodriguez, Julie et al. "Pomegranate extract prevents skeletal muscle of mice against wasting induced by acute TNF- $\alpha$  injection." *Molecular nutrition & food research* vol. 61,4 (2017): 10.1002/mnfr.201600169. doi:10.1002/mnfr.201600169  
<https://onlinelibrary.wiley.com/doi/10.1002/mnfr.201600169>
  15. D'Amico, Davide et al. "Impact of the Natural Compound Urolithin A on Health, Disease, and Aging." *Trends in molecular medicine* vol. 27,7 (2021): 687-699.  
doi:10.1016/j.molmed.2021.04.009  
[https://www.cell.com/trends/molecular-medicine/fulltext/S1471-4914\(21\)00118-0?returnURL=https://www.sciencedirect.com/journal/trends-in-molecular-medicine/issue/S1471-4914\(21\)00118-0](https://www.cell.com/trends/molecular-medicine/fulltext/S1471-4914(21)00118-0?returnURL=https://www.sciencedirect.com/journal/trends-in-molecular-medicine/issue/S1471-4914(21)00118-0)
  16. Ullah, Asad et al. "Important Flavonoids and Their Role as a Therapeutic Agent." *Molecules (Basel, Switzerland)* vol. 25,22 5243. 11 Nov. 2020, doi:10.3390/molecules25225243  
<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7697716/>
  17. Trexler, Eric T et al. "Effects of pomegranate extract on blood flow and running time to exhaustion." *Applied physiology, nutrition, and metabolism = Physiologie appliquee, nutrition et metabolisme* vol. 39,9 (2014): 1038-42. doi:10.1139/apnm-2014-0137  
<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4146683/>
  18. Hord, Norman G et al. "Food sources of nitrates and nitrites: the physiologic context for potential health benefits." *The American journal of clinical nutrition* vol. 90,1 (2009): 1-10. doi:10.3945/ajcn.2008.27131  
<https://academic.oup.com/ajcn/article/90/1/1/4596750?login=false>
  19. de Nigris, Filomena et al. "Beneficial effects of pomegranate juice on oxidation-sensitive genes and endothelial nitric oxide synthase activity at sites of perturbed shear stress." *Proceedings of the National Academy of Sciences of the United States of America* vol. 102,13 (2005): 4896-901. doi:10.1073/pnas.0500998102  
<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC555721/>
  20. Sun, Wenyan et al. "Pomegranate extract decreases oxidative stress and alleviates mitochondrial impairment by activating AMPK-Nrf2 in hypothalamic paraventricular nucleus of spontaneously hypertensive rats." *Scientific reports* vol. 6 34246. 7 Oct. 2016, doi:10.1038/srep34246 <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5054377/>
  21. Ammar, Achraf et al. "Pomegranate Supplementation Accelerates Recovery of Muscle Damage and Soreness and Inflammatory Markers after a Weightlifting Training Session." *PloS one* vol. 11,10 e0160305. 20 Oct. 2016, doi:10.1371/journal.pone.0160305  
<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5072630/>
  22. Al-Dujaili, Emad, and Nacer Smail. "Pomegranate Juice Intake Enhances Salivary Testosterone Levels and Improves Mood and Well Being in Healthy Men and Women." *Www.endocrine-Abstracts.org, BioScientifica*, 1 Mar. 2012, [www.endocrine-abstracts.org/ea/0028/ea0028P313](http://www.endocrine-abstracts.org/ea/0028/ea0028P313)
  23. Türk, Gaffari et al. "Effects of pomegranate juice consumption on sperm quality, spermatogenic cell density, antioxidant activity and testosterone level in male rats." *Clinical nutrition (Edinburgh, Scotland)* vol. 27,2 (2008): 289-96.  
doi:10.1016/j.clnu.2007.12.006  
[https://www.clinicalnutritionjournal.com/article/S0261-5614\(07\)00207-5/fulltext](https://www.clinicalnutritionjournal.com/article/S0261-5614(07)00207-5/fulltext)