

# Quercetin – A Far Better Flu Remedy Than Tamiflu

Analysis by [Dr. Joseph Mercola](#)

✓ Fact Checked

March 16, 2023

## STORY AT-A-GLANCE

- › Your immune system is your first-line defense against all types of infections, be they bacterial or viral, so the most effective way to prevent infectious illness – including influenza – is a robust immune system
- › Quercetin, a plant flavonol found naturally in apples, plums, red grapes, green tea, elder flower and onions, packs a powerful antiviral punch, inhibiting several strains of influenza, hepatitis B and C and other viruses
- › Quercetin also combats inflammation and acts as a natural antihistamine
- › Quercetin reduces viral illness and boosts mental performance following extreme physical stress, which might otherwise undermine your immune function and render you more susceptible to infections
- › Its antiviral effects can be attributed to three main mechanisms of action: Inhibiting the virus' ability to infect cells, inhibiting replication of already infected cells and reducing infected cells' resistance to treatment with antiviral medication

*Editor's Note: This article is a reprint. It was originally published February 26, 2018.*

Your immune system is your first-line defense against all types of infections, be they bacterial or viral, so the most effective way to prevent infectious illness – including influenza – is a robust immune system. Your diet and other lifestyle factors are foundational for good immune function, but certain supplements can also be quite helpful.

One such supplement is quercetin,<sup>1</sup> an antioxidant flavonol found naturally in apples, plums, red grapes, green tea, elder flower and onions, just to name a few. For a more exhaustive list, see Superfoodly's ranking of the top 100 quercetin-packed foods.<sup>2</sup>

Quercetin has been shown to combat inflammation and acts as a natural antihistamine. Elder flower extract, which is rich in quercetin, has been traditionally used as a tonic to boost immunity. It is also widely known to promote lung and bronchial tract health.

Quercetin is also available in supplement form and has been used to ameliorate obesity,<sup>3</sup> Type 2 diabetes,<sup>4</sup> circulatory dysfunction, chronic inflammation, hay fever and mood disorders.<sup>5</sup> A number of studies have also highlighted quercetin's ability to prevent and treat both the common cold<sup>6</sup> and influenza.<sup>7</sup>

## **Quercetin Significantly Lowers Your Risk for Viral Illness**

Research<sup>8</sup> from Appalachian State University in North Carolina published in 2007 found quercetin reduces viral illness and boosts mental performance following extreme physical stress, which might otherwise undermine your immune function and render you more susceptible to infections. The research in question was funded by the U.S. Department of Defense.

To investigate the effects of quercetin on viral illness, 40 cyclists were divided into two groups; half of them received a daily dose of 1,000 mg of quercetin in combination with vitamin C (which enhances plasma quercetin levels<sup>9,10</sup>) and niacin (to improve absorption) for five weeks while the other half received a placebo.

Three weeks into the trial, the athletes rode a bicycle for three hours a day, three days in a row. Blood and tissue samples were collected before and after exertion. Analysis revealed 45% of the placebo group contracted viral illness after the physical stress, compared to just 5% of the treatment group. According to lead investigator David Nieman:

*"That's a highly significant difference. When you have a double-blind, placebo-controlled study and you have those kinds of differences, it can't be due to*

*chance ... These are ground-breaking results because this is the first clinical, double-blind, randomized, placebo-controlled study that has found a natural plant compound to prevent viral illness ...*

*It appears that it takes significant stress to bring out quercetin's infection-fighting properties. This all happened when athletes were under high oxidative stress, when stress hormones were high, and they were also undergoing muscle damage.*

*The athletes taking the quercetin supplement maintained their ability to react to an alertness test when exhausted, whereas those who took the placebo became measurably slower. The infection data and vigilance data are our two biggest findings in this study."*

## **Quercetin Protects Against Flu and Other Viral Infections**

In another study funded by the U.S. Defense Advanced Research Projects Agency (DARPA), published in 2008, animals treated with quercetin were challenged with a highly pathogenic H1N1 influenza virus. Again, the treatment group had significantly lower morbidity and mortality than the placebo group.

These and similar studies led to the development of a quercetin supplement for military personnel. In 2008, DARPA director Tony Tether provided testimony to the Subcommittee on Terrorism, Unconventional Threats and Capabilities, saying quercetin "will help keep our warfighters healthy during training and deployment."

The supplement, Q-Force, is also commercially available to the general public. A number of other studies have confirmed quercetin's effectiveness against influenza, as well as a variety of other viruses, including the following:

A 1985 study found quercetin inhibits infectivity and replication of herpes simplex virus type 1, polio-virus type 1, parainfluenza virus type 3 and respiratory syncytial virus.<sup>11</sup>

---

A 2010 animal study found that quercetin inhibits both influenza A and B viruses. Two other important discoveries were made. Firstly, the viruses were unable to develop resistance to quercetin, and secondly, when used concomitant with antiviral drugs (amantadine or oseltamivir), the effect was significantly amplified – and it prevented drug-resistance from developing.<sup>12</sup>

---

A 2004 animal study investigating quercetin's effect on influenza used a strain of the H3N2 virus. According to the authors:<sup>13</sup>

*"In the mice, instillation of influenza virus A/Udorn/317/72(H3N2) intranasally resulted in a significant decrease in the pulmonary concentrations of catalase, reduced glutathione and superoxide dismutase ... These effects were observed on the 5th day after viral instillation.*

*Oral supplementation with quercetin simultaneous with viral instillation produced significant increases in the pulmonary concentrations of catalase, reduced glutathione and superoxide dismutase ...*

*It is concluded that during influenza virus infection, there is 'oxidative stress.' Because quercetin restored the concentrations of many antioxidants, it is proposed that it may be useful as a drug in protecting the lung from the deleterious effects of oxygen derived free radicals released during influenza virus infection."*

---

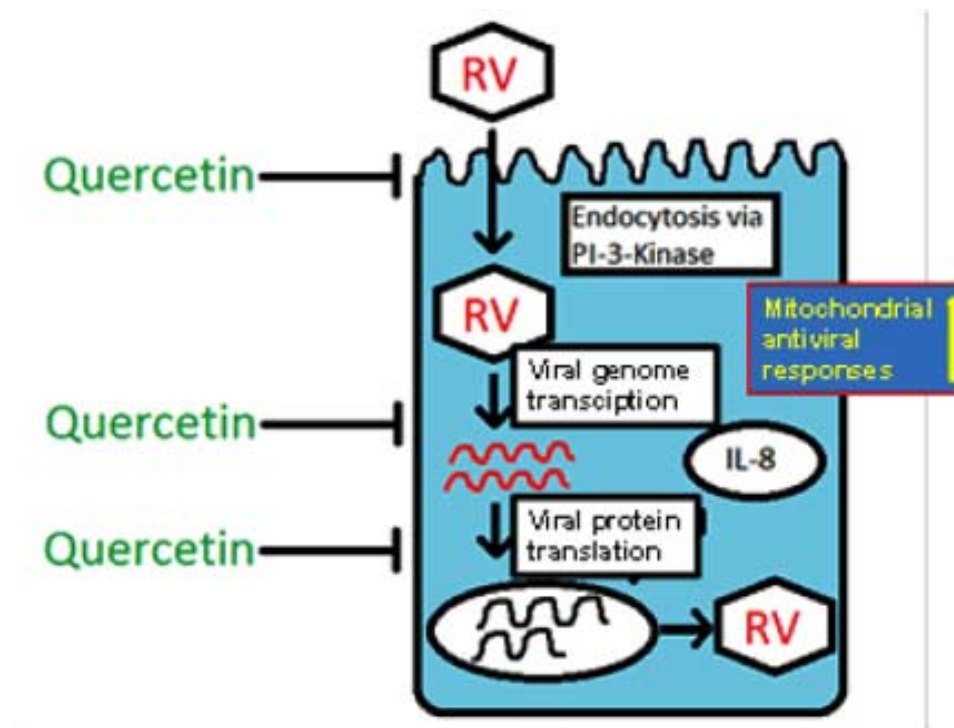
In 2014, researchers noted that quercetin appears to be "a promising treatment for the common cold," caused by the rhinovirus, adding that "Quercetin has been shown to reduce viral internalization and replication in vitro, and viral load, lung inflammation and airways hyper-responsiveness in vivo."<sup>14</sup>

By attenuating oxidative damage, it also lowers your risk of secondary bacterial infections, which is actually the **primary cause of influenza-related deaths**.

Importantly, quercetin increases mitochondrial biogenesis in skeletal muscle, which

suggests part of its antiviral effects are due to enhanced mitochondrial antiviral signaling. According to the authors:

*"... In vitro studies have demonstrated that quercetin acts as a potent antiviral agent by inhibiting viral replication of several respiratory viruses, including influenza virus, parainfluenza virus, respiratory syncytial virus, adenovirus and rhinovirus. Although the quercetin's antiviral mechanisms are not well understood, a number of possibilities have been proposed and is summarized in Figure 1."*



**Figure 1:** Quercetin inhibits viral replication at various stages: blocks endocytosis via inhibition of PI-3 kinase, transcription of viral genome by inhibiting RNA polymerase 3D POL and viral protein translation by promoting cleavage of eIF4G. At the same time quercetin also increases viral clearance by enhancing mitochondrial antiviral responses. All these events together lead to reduced pro-inflammatory responses.

Source: [Journal of Infectious Diseases and Preventive Medicine May 24, 2014; 2: 111](#)

A 2016 animal study found quercetin inhibited mouse hepatitis virus and the dengue

virus.<sup>15</sup>

---

Another 2016 study found quercetin offered protection against influenza A virus H1N1 by modulating protein expression. More specifically, the regulation of heat shock proteins, fibronectin 1 and prohibitin was instrumental in reducing viral replication.<sup>16</sup>

---

A third study published in 2016 found quercetin inhibited a wide spectrum of influenza strains, including H1N1, H3N2 and H5N1. According to the authors, "This study indicates that quercetin showing inhibitory activity in the early stage of influenza infection provides a future therapeutic option to develop effective, safe and affordable natural products for the treatment and prophylaxis of [influenza A viruses] infections."<sup>17</sup>

---

## Quercetin Inhibits Hepatitis B and C

In summary, quercetin's powerful antiviral effects can be attributed to three main mechanisms of action:

1. Inhibiting the virus' ability to infect cells
2. Inhibiting replication of already infected cells
3. Reducing infected cells' resistance to treatment with antiviral medication

As you can see from the list of studies above, quercetin's ability to prevent illness is not restricted to influenza. Research shows it's incredibly effective for boosting general immune health, and studies have shown it can inhibit both hepatitis B<sup>18</sup> and C<sup>19</sup> infection. It may even be useful in the treatment of HIV. As noted in a Superfoods Scientific Research article on quercetin:<sup>20</sup>

*"Hepatitis C is an important cause of liver failure and liver cancers. In August 2009, [a] cell study<sup>21</sup> demonstrated that quercetin interfered with the gene signals that enable hepatitis C virus production. The researchers showed ...*

*quercetin inhibits hepatitis C viral production in tissue culture, at least partially through its inhibition of heat shock protein expression.*

*Therapy with quercetin reduced the infectious particle production to nontoxic concentrations of [hepatitis C virus]."*

Similarly, research published in 2015 found quercetin inhibited hepatitis B virus replication in human liver cells, protecting cells from infection and limiting the spread of infection in already infected samples.<sup>22</sup> As in previous studies, when combined with antiviral drugs, in this case lamivudine, entecavir or adefovir, the antiviral effect was greatly enhanced.

According to the authors, "The results indicate that quercetin inhibited HBV [hepatitis B virus] antigen secretion and genome replication in human hepatoma cell lines, which suggests that quercetin may be a potentially effective anti-HBV agent."

## **Quercetin a Far Safer Alternative to Tamiflu**

Should you or your child come down with the flu and your doctor or pediatrician recommends Tamiflu, you should know this antiviral drug has been shown to shorten the duration of flu symptoms by less than 17 hours.<sup>23,24</sup> It also does not reduce viral transmission and does not lower your risk of complications from the flu, such as pneumonia.<sup>25,26</sup> Scientists have also warned that the risks far outweigh the benefits.<sup>27</sup>

These risks include convulsions, brain infections, psychosis and other neuropsychiatric problems. Tamiflu made recent headlines after a 6-year-old girl started hallucinating and attempted to jump out a second story window.<sup>28</sup> Indeed, a number of studies have observed that Tamiflu may cause psychiatric symptoms, including mood swings, suicidal feelings, auditory hallucinations, memory deterioration and insomnia.<sup>29</sup>

The drug is particularly risky for children, and more than half of all children taking Tamiflu suffer side effects from the drug.<sup>30,31</sup> Considering its risks, and its limited effectiveness, quercetin appears to be a far safer and more effective alternative. Studies have repeatedly found it to be nontoxic, with no adverse side effects.

## **Vitamin D – Another Potent Immune Booster and Antiviral**

Optimizing your vitamin D is another important prevention strategy that will boost your immune function and help prevent infectious diseases of all kinds.

The latest research suggests a vitamin D serum level of 60 to 80 ng/mL is ideal. While conventional health authorities claim getting an annual flu shot is the best way to ward off influenza, the medical literature actually suggests vitamin D optimization may be a far more effective strategy, and the evidence for this goes back at least a decade.

Dr. John Cannell, founder of the Vitamin D Council, was one of the first to introduce the idea that vitamin D deficiency may actually be a causative factor in influenza. His hypothesis<sup>32</sup> was initially published in the journal *Epidemiology and Infection* in 2006.<sup>33</sup> It was subsequently followed up with another study published in the *Virology Journal* in 2008.<sup>34</sup>

The following year, a large, nationally representative study<sup>35</sup> confirmed that people with the lowest vitamin D levels indeed reported having significantly more colds or cases of the flu. Since then, a number of studies have come to similar conclusions.

Most recently, a scientific review<sup>36,37</sup> published last year concluded that vitamin D supplementation boosts immunity and cuts rates of cold and flu. In all, 25 randomized controlled trials were included in the review, involving nearly 11,000 individuals from more than a dozen countries.

People with significant vitamin D deficiency (blood levels below 10 ng/mL), taking a vitamin D supplement reduced their risk of respiratory infections such as influenza by 50%. People with higher vitamin D levels also benefited, although not as greatly.

Overall, they reduced their risk by about 10%, which the researchers stated was about equal to the effect of flu vaccines. Coincidentally, 10% is the effectiveness rate of this year's flu vaccine.<sup>38</sup> The take-home message here is that vitamin D supplementation far exceeds the flu vaccine in terms of effectiveness, and the more deficient you are, the greater its protective effects.



Aside from vitamin D and quercetin, loading up on vitamins B1 and C may go a long way toward keeping you healthy through the flu season and beyond. Influenza has also been successfully treated with high-dose vitamin C,<sup>39</sup> and vitamin C also boosts the effectiveness of quercetin. Taking zinc lozenges at the first sign of a cold or flu can also be helpful.

## Sources and References

---

- <sup>1, 5</sup> [Fitoterapia 2015 Oct;106:256-71](#)
- <sup>2</sup> [Superfoodly, 100 Quercetin Foods](#)
- <sup>3</sup> [Food Chemistry Volume 179. Pages 305-310. July 15, 2015](#)
- <sup>4</sup> [Biomedicine & Pharmacotherapy Volume 146. February 2022](#)
- <sup>6</sup> [Semantic Scholar. 2014](#)
- <sup>7</sup> [Biomolecules. December 24, 2020](#)
- <sup>8</sup> [Newswise. Appalachian State University February 8, 2007](#)
- <sup>9</sup> [Journal of the American Dietetic Association 2011 Apr;111\(4\):542-9](#)
- <sup>10, 14</sup> [Journal of Infectious Diseases and Preventive Medicine May 24, 2014; 2: 111](#)
- <sup>11</sup> [Journal of Medical Virology January 1985 DOI: 10.1002/jmv.1890150110](#)
- <sup>12</sup> [Antiviral Research 2010 Nov;88\(2\):227-35](#)
- <sup>13</sup> [Experimental Lung Research 2005; 31\(5\)](#)
- <sup>15</sup> [Asian Pacific Journal of Tropical Medicine January 2016; 9\(1\): 1-7](#)
- <sup>16</sup> [Journal of Agricultural and Food Chemistry 2016; 64\(21\): 4416-4425](#)
- <sup>17</sup> [Viruses 2016 Jan; 8\(1\): 6](#)
- <sup>18, 22</sup> [Virologica Sinica August 2015; 30\(4\): 261-268](#)
- <sup>19, 21</sup> [Hepatology 2009 Dec;50\(6\):1756-64](#)
- <sup>20</sup> [Superfoods Scientific Research, Quercetin](#)
- <sup>23, 25</sup> [BMJ 2014;348:g2545](#)
- <sup>24</sup> [Forbes April 10, 2014](#)
- <sup>26</sup> [The Guardian April 10, 2014](#)
- <sup>27</sup> [Cochrane Database of Systematic Reviews 2014, Issue 4. Art. No.: CD008965](#)
- <sup>28</sup> [Newsweek January 15, 2018](#)
- <sup>29</sup> [Clin Psychopharmacol Neurosci. 2015 Aug; 13\(2\): 209–211](#)
- <sup>30</sup> [The Guardian July 31, 2009](#)
- <sup>31</sup> [Eurosurveillance July 2009; 14\(30\)](#)
- <sup>32</sup> [Epidemic Influenza and Vitamin September 15, 2006](#)
- <sup>33</sup> [Epidemiology and Infection 2006 Dec;134\(6\):1129-40](#)
- <sup>34</sup> [Virology Journal 2008; 5:29](#)
- <sup>35</sup> [Archives of Internal Medicine 2009;169\(4\):384-390](#)
- <sup>36</sup> [BMJ 2017; 356:i6583](#)

- <sup>37</sup> NPR February 16, 2017
- <sup>38</sup> New England Journal of Medicine January 4, 2018; 378:7-9
- <sup>39</sup> Journal of Manipulative and Physiological Therapeutics 1999 Oct;22(8):530-3