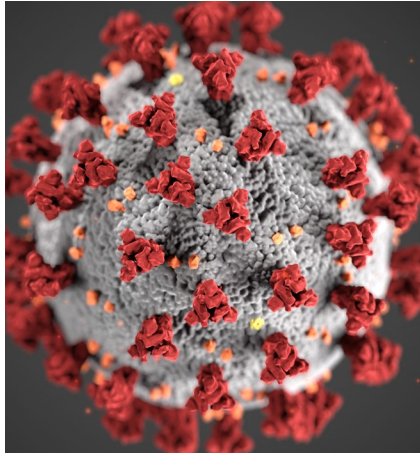


Dietary Supplements in the Time of COVID-19

Fact Sheet for Consumers



COVID-19 is the disease caused by SARS-CoV-2, the coronavirus that emerged in December 2019

What is COVID-19?

COVID-19 (coronavirus disease of 2019) was first identified in late 2019. This disease is caused by the novel (new) severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2).

People with COVID-19 commonly get a cough, fever, headache, muscle aches and pain, and diarrhea, and become extremely tired. The signs and symptoms can be very different from person to person. Some people with COVID-19 become very sick about a week after symptoms start. They might have trouble breathing and develop pneumonia. Their kidneys, liver, or lungs might stop working, and they could die. Some people also get a chronic (long term) condition called long COVID. The symptoms of long COVID include fatigue, muscle weakness, sleep difficulties, and trouble thinking clearly and remembering.

COVID-19 spreads very easily from person to person, especially when people are closer than 6 feet apart and are not wearing masks. People who are infected but do not have symptoms can also spread the virus to others. When an infected person talks or coughs, tiny droplets spread COVID-19 in the air. These droplets can be breathed in by other people or land in their eyes, nose, or mouth.

How does your immune system respond to COVID-19?

If you come into contact with COVID-19, your body's immune system will try to fight off the disease. Your immune system is made up of cells, tissues, and organs that help fight germs that cause infections and other diseases. For example, your skin helps prevent germs from getting inside your body. Cells that line your digestive tract help protect against harmful bacteria, viruses, and other germs that cause diseases. White blood cells try to destroy substances they recognize as foreign to your body. Some white blood cells also recognize germs they have been exposed to before and develop antibodies to defend against them in the future. If you had chicken pox as a child, for example, your immune system made antibodies against the virus that caused it, so if you're exposed to chicken pox again, you won't get sick.

Your immune system also responds to germs by causing inflammation—redness, swelling, and heat—that helps kill the germs so your body can heal. But inflammation can also cause damage. Some people with COVID-19 have lung damage caused by inflammation. Other people experience a severe immune response (known as a cytokine storm) that is very serious and increases the risk of death.

Vaccines teach your immune system how to fight off germs that cause disease. When you get vaccinated for a particular germ, your white blood cells make antibodies to that germ. If you're exposed to it again, your antibodies will recognize and destroy the germ. Common vaccines include those to prevent polio, whooping cough, and tetanus. Some vaccines need to be given more than once. For example, you need a flu shot every year and a tetanus booster every 10 years. COVID-19 vaccines are available for anyone aged 5 years or older.

What do we know about specific dietary supplement ingredients and COVID-19?

Research hasn't clearly shown that any dietary supplement helps prevent COVID-19 or can decrease the severity of COVID-19 symptoms. Only vaccines and medications can prevent COVID-19 and treat its symptoms.

Your immune system needs certain vitamins and minerals to work properly. These include vitamin C, vitamin D, and zinc. Herbal supplements, probiotics, and other dietary supplement ingredients might also affect immunity and inflammation.

You might wonder whether taking certain dietary supplements can help your immune system work better or make you less likely to get sick or die of COVID-19. Scientists are looking at how some dietary supplement ingredients might affect the body's ability to fight infections, viruses, and other diseases. The results so far do not show that any are useful for COVID-19.

This fact sheet explains what we know about the safety and effectiveness of some of these dietary supplement ingredients. They are listed in alphabetical order. We also include information about how these ingredients might interact with common medications.

The [health professional version](#) of this fact sheet includes more details and references to the scientific literature.



Andrographis

Andrographis is an herb native to Southeast Asia. It might help fight viruses, reduce inflammation, and stimulate the immune system.

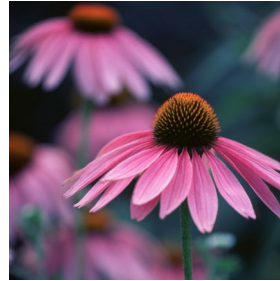
Does it work?

Andrographis might make respiratory tract infections less severe. A few small studies in Thailand suggest that andrographis might help relieve minor to moderate symptoms of COVID-19, such as cough, but more research is needed. One clinical trial is underway to see whether andrographis helps reduce symptoms in people who have COVID-19, but results are not yet available.

Is it safe?

Side effects of andrographis include nausea, vomiting, dizziness, skin rashes, diarrhea, and fatigue. Andrographis might decrease blood pressure and disrupt blood clotting, so it might interact with blood pressure medications and blood thinners by increasing their effects. Andrographis might also decrease the effectiveness of medications that suppress the

immune system. Andrographis might affect fertility, so some scientists recommended avoiding it if you are pregnant or planning to have a baby.



Echinacea

Echinacea is an herb that grows in North America and Europe. It might act as an antioxidant and help stop the growth or spread of some types of viruses and other germs. It might also activate the immune system and

reduce inflammation. Echinacea has been studied mainly for its effect on colds and other respiratory tract infections.

Does it work?

Echinacea might slightly reduce the risk of getting the common cold, but it has been studied for COVID-19 only with ginger and hydroxychloroquine in one small study. In this study, the mixture of echinacea, ginger, and hydroxychloroquine relieved coughing, muscle pain, and shortness of breath, but it did not reduce the severity of fever or sore throat or affect the chances of having to be hospitalized.

Is it safe?

Side effects of echinacea can include stomach upset and skin rashes. Echinacea might reduce the effectiveness of medications that suppress the immune system and other medications. Scientists don't know if echinacea is safe to take during pregnancy.



Elderberry

Elderberry is the fruit of a tree that grows in North America, Europe, and parts of Africa and Asia. Elderberry might act as an antioxidant, reduce inflammation, and help fight viruses and other germs. It

might also stimulate the immune system.

Does it work?

Elderberry might help relieve symptoms of the common cold and flu and help people recover quicker, but it hasn't been studied for COVID-19.

Is it safe?

Elderberry flowers and ripe fruit appear to be safe to eat. However, the bark, leaves, seeds, raw fruit, and unripe elderberry fruit can be poisonous and can cause nausea, vomiting, diarrhea, and dehydration. Elderberry might affect

insulin and blood sugar levels and reduce the effectiveness of medications that suppress the immune system. Scientists don't know if elderberry is safe to take during pregnancy.



Ginseng

Ginseng (*Panax ginseng* or *Panax quinquefolius*) is a plant used in traditional Chinese medicine. It might stimulate the immune system, reduce inflammation, and help the body fight viruses.

Does it work?

It's not clear whether ginseng helps to protect against the common cold, flu, or other upper respiratory tract infections. Ginseng has not been studied in people with COVID-19. However, a couple of clinical trials are underway. They are looking at ginseng as part of traditional Chinese medicine in people with COVID-19, but results are not yet available.

Is it safe?

Side effects of ginseng can include headache, trouble sleeping, and digestive upset. High doses (more than 2.5 g/day) of ginseng might cause insomnia, rapid heartbeat, high blood pressure, and nervousness. Ginseng might interact with diabetes medications, stimulants, and medications that suppress the immune system.



Magnesium

Magnesium is an essential mineral found mainly in beans, nuts, seeds, whole grains, and green leafy vegetables. Your body needs magnesium for making protein, bone, and DNA and to regulate muscle

and nerve function, blood sugar levels, and blood pressure.

The Recommended Dietary Allowance (RDA) for magnesium ranges from 30 to 410 mg for infants and children, depending on age, and from 310 to 420 mg for adults.

Does it work?

People with low levels of magnesium might have high blood pressure, heart disease, type 2 diabetes, or other conditions that make it more difficult to recover from COVID-19. But it's not clear if magnesium supplements help fight COVID-19.

One small study found that middle-aged patients in the hospital with COVID-19 were less likely to need oxygen therapy, intensive care support, or both when they received daily supplements of magnesium plus vitamins D and B12.

A few clinical trials are underway to see whether dietary supplements containing magnesium help reduce symptoms in people who have COVID-19, but results are not yet available.

Is it safe?

Magnesium in foods is safe in any amount. Magnesium in dietary supplements or in medications that contain magnesium (such as some laxatives) is safe at daily intakes up to 65 to 350 milligrams (mg) for children, depending on age, and up to 350 mg for adults. Taking more can cause diarrhea, nausea, and stomach cramping. Extremely high doses can cause more serious problems, including irregular heartbeat and cardiac arrest.

Magnesium supplements can interact with some medications, including bisphosphonates (used to prevent bone loss), antibiotics, diuretics, and proton pump inhibitors (used to reduce stomach acid).

For more information, read our fact sheet on [magnesium](#).

Melatonin

Melatonin is a hormone that helps regulate your sleep-wake cycle. It might also increase immune function, act as an antioxidant, and reduce inflammation.

Does it work?

One study found that people who reported taking melatonin supplements were less likely than others to get COVID-19. Several clinical trials are underway to see whether melatonin helps reduce symptoms in people who have COVID-19, but results are not yet available.

Is it safe?

Melatonin appears to be safe for short-term use at doses up to 10 mg/day. High blood levels of melatonin might cause delayed puberty and lower testosterone and sperm levels. Melatonin might increase the risk of bleeding if used with blood thinners and might also reduce the effectiveness of anticonvulsant and medications that suppress the immune system. Melatonin might affect how the ovaries work, so some scientists recommend avoiding it if you are pregnant or breastfeeding.

N-acetylcysteine

NAC acts as an antioxidant and helps reduce mucus in the respiratory tract (mouth, nose, throat, and lungs). NAC might also increase immune function, help fight viruses, and reduce inflammation.

Does it work?

NAC might help reduce the symptoms of bronchitis, chronic obstructive pulmonary disease, and similar disorders that affect breathing. One small study found that giving 600 mg NAC twice a day for 2 weeks to patients hospitalized with COVID-19 lowered the chance of needing a ventilator and improved the chance of survival.

In another trial, patients with COVID-19 (or suspected of having COVID-19) received intravenous infusions of NAC or a placebo. NAC did not reduce the number of patients admitted to the intensive care unit (ICU) or the time patients spent in the ICU. It also did not reduce the chance of needing a ventilator or the likelihood of dying from the disease.

Is it safe?

Side effects of NAC can include nausea, vomiting, stomach pain, diarrhea, indigestion, and heartburn. NAC might disrupt blood clotting and lower blood pressure. Taking NAC with nitroglycerine (used to treat chest pain) might cause low blood pressure and severe headaches.



Omega-3 fatty acids

Omega-3s are polyunsaturated fatty acids found in fatty fish and fish oils. They're also found in plant oils, such as flaxseed, soybean, and canola oils. Omega-3s are important for healthy cell membranes

and proper function of the heart, lungs, immune system, and endocrine system.

Do they work?

One study found that people who reported taking omega-3 supplements were less likely than others to get COVID-19. Another study found that omega-3 supplements improved survival rates and lung and kidney function in patients in the hospital with COVID-19, but more research is needed.

Several other clinical trials are underway to see whether omega-3s help reduce the risk of COVID-19 or help reduce symptoms in people who have COVID-19, but results are not yet available.

Are they safe?

Omega-3 supplements are safe at doses up to about 5 g/day. Side effects include a bad taste in the mouth, bad breath, heartburn, nausea, digestive discomfort, diarrhea, headache, and smelly sweat. Omega-3s might interact with blood thinners, blood pressure medications, and medications that suppress the immune system.

For more information, read our fact sheet on [omega-3 fatty acids](#).



Probiotics

Probiotics are live microorganisms (bacteria and yeasts) that provide health benefits. They are naturally present in some fermented foods, added to some food products, and available as dietary supplements.

Probiotics might increase immune function and might help fight viruses.

Do they work?

Probiotics might help protect against some respiratory tract infections. One study found that people who reported taking probiotic supplements were less likely to get COVID-19. Another study found that a probiotic containing the bacteria *Streptococcus*, *Lactobacillus*, and *Bifidobacterium* in addition to medications reduced symptoms in patients with COVID-19, but more research is needed.

Several other clinical trials are underway to see whether probiotics help reduce the risk of COVID-19 or help reduce symptoms in people who have COVID-19, but results are not yet available.

Are they safe?

Probiotics are safe for most people. Side effects can include gas and other digestive symptoms. In people who are very ill or have immune system problems, probiotics might cause severe illness. Although probiotics don't appear to interact with medications, taking antibiotics or antifungal medications might decrease the effectiveness of some probiotics.

For more information, read our fact sheet on [probiotics](#).



Quercetin

Quercetin is a flavonoid found in many fruits, vegetables, spices, and beverages including citrus fruits, apples, onions, berries, broccoli, cilantro, dill, tea, and red wine. Quercetin might increase immune

function, act as an antioxidant, and reduce inflammation.

Does it work?

Quercetin has been studied to see if it reduces the risk of upper respiratory tract infections or reduces the severity of symptoms, but it's not clear whether it helps. Only a few studies have examined the effects of quercetin in patients with COVID-19. These studies have used doses of 400 to 600 mg/day for several weeks, and the results suggest that quercetin might reduce the severity of disease and help patients recover somewhat quicker, but more research is needed.

Several other clinical trials are underway to see whether quercetin helps reduce the risk of COVID-19 or reduces symptoms in people who have COVID-19, but results are not yet available.

Is it safe?

No serious adverse effects have been reported from the use of quercetin supplements, but they might cause stomach pain, acid reflux, constipation, diarrhea, flatulence, and trouble sleeping.

Quercetin might interact with some medications, including medications that suppress the immune system, pravastatin (used to treat high cholesterol), fexofenadine (used to treat allergies and hives), and blood pressure medicines.



Selenium

Selenium is an essential mineral found in many foods, including Brazil nuts, seafood, meat, poultry, eggs, dairy products, bread, cereals, and other grain products.

It acts as an antioxidant and

is important for reproduction, thyroid gland function, and DNA production.

The RDA ranges from 15 to 70 micrograms (mcg) for infants and children, depending on age, and from 55 to 70 mcg for adults.

Does it work?

Some research suggests that 100 to 300 mcg/day of supplemental selenium might help improve immune function. Some studies link low selenium levels with a higher risk of COVID-19 and more severe disease, but more research is needed.

Several clinical trials are underway to see whether taking supplements that contain selenium (usually in combination with other vitamins and minerals) reduces the severity of disease in people with COVID-19 or the chances of being hospitalized, but results are not yet available.

Is it safe?

Selenium is safe at daily intakes up to 45 to 400 mcg for infants and children, depending on age, and up to 400 mcg for adults. Higher intakes can cause a garlic odor in the breath, a metallic taste in the mouth, hair and nail loss or brittleness, abnormal skin growths, nausea, diarrhea, skin rashes, mottled teeth, extreme tiredness, irritability, and nervous system problems.

Selenium might interact with cisplatin (a drug used in chemotherapy).

For more information, read our fact sheet on [selenium](#).



Vitamin C

Vitamin C is an essential nutrient found in citrus fruits and many other fruits and vegetables. Vitamin C is important for healthy immune function.

The RDA ranges from 15 to 115 mg for infants and children,

depending on age, and from 75 to 120 mg for nonsmoking adults. People who smoke need 35 mg more than the RDA per day.

Does it work?

Vitamin C might help reduce the number of days the common cold lasts and decrease symptoms. It might also help reduce the risk of getting a cold in people who undergo extreme physical stress, such as marathon runners.

It's not clear whether vitamin C helps fight COVID-19. In a clinical trial, daily supplementation with 8,000 mg vitamin C, 50 mg zinc, or both for 10 days in people with COVID-19 did not shorten the number of days people had symptoms.

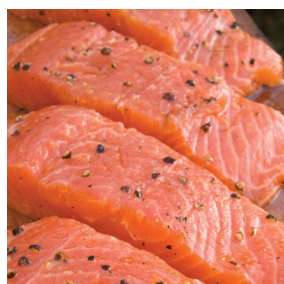
Several other clinical trials are underway to see whether vitamin C helps reduce the risk of COVID-19 or helps reduce symptoms in people who have COVID-19, but results are not yet available.

Is it safe?

Vitamin C is safe at intakes up to 400 to 1,800 mg/day for children, depending on age, and up to 2,000 mg/day for adults. Higher intakes can cause diarrhea, nausea, and stomach cramps, and might also cause false readings on blood sugar monitors. In people with hemochromatosis (an iron overload disorder), high amounts of vitamin C might cause iron build-up in the body, which can damage body tissues.

Vitamin C supplements might decrease the effectiveness of radiation therapy and chemotherapy.

For more information, read our fact sheet on [vitamin C](#).

**Vitamin D**

Vitamin D is an essential nutrient that is naturally present in fatty fish and fish liver oils, and in small amounts in beef liver, egg yolks, and cheese. It's also added to some foods, such as fortified milk.

Your body can also make vitamin D when your skin is exposed to the sun. Vitamin D is important for healthy bones and immune function.

The RDA ranges from 10 to 15 mcg (400 International Units [IU] to 600 IU) for infants and children, depending on age, and from 15 to 20 mcg (600 to 800 IU) for adults.

Does it work?

Vitamin D might help protect against some respiratory tract infections, especially in people with low vitamin D levels. Some studies show that low vitamin D levels are linked with a higher risk of COVID-19 and more severe disease, but others do not. Other research suggests that people who regularly take vitamin D supplements might have a lower risk of SARS-CoV-2 infection and a lower risk of death from COVID-19.

In one clinical trial, people in the hospital with moderate to severe COVID-19 who were given a single dose by mouth of 5,000 mcg (200,000 IU) vitamin D did not have a shorter hospital stay or lower risk of death, even those whose vitamin D levels were low when they were entered the hospital.

Another clinical trial in Saudi Arabia gave adults who were in the hospital with mild to moderate COVID-19 either 125 mcg (5,000 IU) or 25 mcg (1,000 IU) vitamin D3. Some symptoms improved more quickly in the patients who received 125 mcg vitamin D3, but the length of time most symptoms lasted did not differ between groups.

Several other clinical trials are underway to see whether vitamin D helps reduce the risk of COVID-19 or helps reduce

symptoms in people who have COVID-19, but results are not yet available.

Is it safe?

Vitamin D is safe at daily intakes up to 25 to 100 mcg (1,000 to 4,000 IU) for children (depending on age) and up to 100 mcg (4,000 IU) for adults. Higher intakes can cause nausea, vomiting, muscle weakness, confusion, pain, loss of appetite, dehydration, excessive urination and thirst, and kidney stones. Extremely high doses can cause kidney failure, damaged blood vessels and heart valves, heart rhythm problems, and death.

Vitamin D supplements might interact with some medications such as orlistat (used for weight loss), statins (used to lower cholesterol levels), thiazide diuretics (used for high blood pressure), and steroids.

For more information, read our fact sheet on [vitamin D](#).

**Vitamin E**

Vitamin E (also called alpha-tocopherol) is an essential nutrient found in nuts, seeds, vegetable oils, and green leafy vegetables. It acts as an antioxidant and helps your immune system function properly.

The RDA is 4 to 15 mg for infants and children, depending on age, and 15 to 19 mg for adults.

Does it work?

Some studies suggest that vitamin E supplements help reduce the risk of upper respiratory tract infections, but others do not.

It's not known whether vitamin E reduces the risk of COVID-19 or reduces disease severity, but several clinical trials are underway. These are examining whether vitamin E with other vitamins and minerals helps reduce the severity of COVID-19 symptoms or the chances of being hospitalized, but results are not yet available.

Is it safe?

Vitamin E in food is safe at any level. In supplements, vitamin E is safe at daily intakes up to 200 to 800 mg for children, depending on age, and up to 1,000 mg/day for adults. Higher intakes can increase the risk of bleeding and stroke.

Vitamin E supplements might interact with blood thinners and might reduce the effectiveness of radiation therapy and chemotherapy.

For more information, read our fact sheet on [vitamin E](#).



Zinc

Zinc is an essential nutrient found in seafood, meat, beans, nuts, whole grains, and dairy products. It's important for a healthy immune system, making proteins and DNA, healing wounds, and for taste and smell.

The RDA ranges from 2 to 13 mg for infants and children, depending on age, and from 8 to 12 mg for adults.

Does it work?

Zinc lozenges might help shorten the number of days the common cold lasts. It's not clear whether zinc helps protect against COVID-19. Some studies link low zinc levels with a higher risk of COVID-19 and more severe disease, but others do not.

In a clinical trial, people who had COVID-19 but were not in the hospital took 50 mg zinc, 8,000 mg vitamin C, or both for 10 days. The supplements did not shorten the number of days people had symptoms.

Several other clinical trials are underway to see if zinc helps reduce the risk of COVID-19 or helps reduce symptoms in people who have COVID-19, but results are not yet available.

Is it safe?

Zinc is safe at daily intakes up to 4 to 34 mg for infants and children, depending on age, and up to 40 mg for adults. Higher intakes can cause nausea, vomiting, loss of appetite, stomach cramps, diarrhea, and headaches. High intakes of zinc over a long time can cause decreased immune function and low blood levels of copper.

Zinc supplements might interact with antibiotics, penicillamine (used to treat rheumatoid arthritis), and thiazide diuretics (used to treat high blood pressure).

For more information, read our fact sheet on [zinc](#).

Do dietary supplements interact with medications or other supplements?

Yes, some supplements can interact or interfere with medicines you take.

Tell your doctor, pharmacist, and other healthcare providers about any dietary supplements and medicines you take. They can tell you if those dietary supplements might interact or interfere with your prescription or over-the-counter medicines or if the medicines might interfere with how your body absorbs, uses, or breaks down nutrients.

Disclaimer

This fact sheet by the National Institutes of Health (NIH) Office of Dietary Supplements (ODS) provides information that should not take the place of medical advice. We encourage you to talk to your healthcare providers (doctor, registered dietitian, pharmacist, etc.) about your interest in, questions about, or use of dietary supplements and what may be best for your overall health. Any mention in this publication of a specific product or service, or recommendation from an organization or professional society, does not represent an endorsement by ODS of that product, service, or expert advice.



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