What are the benefits of spirulina?

Spirulina is a type of blue-green algae that some people take as a dietary supplement. Potential benefits include positive effects on eye health, blood pressure, and cholesterol levels.

Spirulina is an algae that contains protein and vitamins, making it a suitable dietary supplement for people on vegetarian or vegan diets.

Research suggests it has antioxidant and inflammation-fighting properties and may help regulate the immune system.

1. Excellent nutritional profile
Anastasiia Yanishevska/Getty Images
According to the United States Department of Agriculture (USDA), one tablespoon or 7 grams (g) of dried spirulina containsTrusted Source:

20.3 calories
4.02 g of protein
1.67 g of carbohydrate
0.54 g of fat
8.4 milligrams (mg) of calcium
2 mg of iron
13.6 mg of magnesium
8.26 mg of phosphorus
95.2 mg of potassium
73.5 mg of sodium
0.7 mg of vitamin C
It also contains thiamin, riboflavin, niacin, folate, and vitamins A, B6, and K.

Spirulina contains a range of antioxidants, including phycocyanin, a blue-green pigment. Antioxidants, such as those in spirulina, may help fight free radicals and protect the body from cell damage.

Free radicals form in the body due to natural processes and exposure to harmful substances, such as alcohol, tobacco, and some foods. They can cause tissue damage and may increaseTrusted Source the risk of certain health conditions, such as cancer.

2. Eye health
Spirulina contains the antioxidant beta carotene. The body converts beta carotene into vitamin A, which plays a key roleTrusted Source in eye health.

In a 2019 animal study, researchers gave mice either a standard diet or a diet containing 20% spirulina for 4 weeks. Then, they left the mice in darkness, followed by 1 hour of white light exposure.

The mice that consumed spirulina had better protection and less damage to the retina and photoreceptors in their eyes. However, more research is necessary to see if these results apply to humans.

It is worth noting that nutrients vary between products, and products in experiments may be different than those available to consumers. For example, the spirulina product that the USDATrusted Source analyzes contains no zeaxanthin and only small amounts of beta carotene.

3. Oral health

A 2022 study involving 60 people with periodontitis tested spirulina's antioxidant effects on gum disease. Half of the participants had Scaling and Root planning (SRP) treatment and a placebo, and the other half had SRP treatment with spirulina.

The researchers suggested that local drug delivery of spirulina with SRP treatment may have a beneficial antioxidant effect on chronic periodontitis.

A 2022 review looked at spirulina's effects on managing oral submucous fibrosis, a chronic precancerous condition that affects the throat and mouth.

The studies in the review suggested spirulina may be effective at managing this condition. However, the researchers highlight that current evidence has a high risk of bias, and more research is necessary.

Various algae types may benefitTrusted Source oral health due to their antimicrobial activity. This may make them a useful therapy for caries and other bacterial and fungal infections. However, more research is necessary to support this.

4. Losing weight

A 2020 review suggests that spirulina may have benefits for reducing:

body mass index (BMI)
body fat
waist circumference
appetite

It may also help to improve the levels of fats in the blood. One possible reason is that ingredients in spirulina prevent the small intestine from absorbing as much fat.

However, further research, including larger clinical trials, is necessary to confirm these potential effects.

5. Improving gut health
Some animal research suggests that spirulina may affect gut health.

For example, a 2017 studyTrusted Source on older mice suggests that spirulina may preserve healthy gut bacteria during the aging process. However, more research is necessary to understand how spirulina may affect gut health in humans.

6. Managing glucose levels
Research in a 2018 review suggests that spirulina can significantly lower fasting blood sugar, as well as other cardiovascular and metabolic biomarkers.

A 2021 meta-analysis of eight studies also found that spirulina significantly reduced the following markers in people with type 2 diabetes:

fasting blood sugar
triglycerides
total cholesterol
low density lipoprotein cholesterol
very low density lipoprotein cholesterol
It also increased high density lipoprotein, which some people may call “good” cholesterol in the population.

7. Lowering cholesterol
A 2023 review suggests that spirulina supplementation may help to:

reduce low-density lipoprotein cholesterol levels, or “bad” cholesterol
reduce total cholesterol levels
reduce triglycerides
increase high-density lipoprotein cholesterol levels, or “good” cholesterol
However, more research, including larger trials with a varied candidate pool, is necessary.

8. Reducing blood pressure
A 2021 review suggests that spirulina may help to prevent and treat high blood pressure.

Research in the review suggests that spirulina supplementation significantly reduced systolic and diastolic blood pressure. The reductions were greater in people with high blood pressure than typical blood pressure levels.

However, reduction also varied in different control trials. The researchers suggest that other factors may affect the results, including:

general diet
physical activity levels
smoking status
More research is necessary to understand the full effects of spirulina on blood pressure levels.

9. Preventing heart disease
High blood pressure and high cholesterol levels can both increaseTrusted Source a person's risk of heart disease.

Research in a 2024 article suggests that spirulina may have potential benefits for various heart-related diseases. It may work by limiting or preventing risk factors for these conditions, including:

high blood pressure
high blood sugars
high levels of fats in the blood
However, more research is necessary, particularly to learn if dosage and timing may affect spirulina's therapeutic potential.

10. Managing allergic rhinitis
People may experience allergic rhinitis in response to allergens, such as dust mites, pet hair, or pollen.

In 2020, researchersTrusted Source gave 53 people with allergic rhinitis either 2 g per day of spirulina platensis or 10 g per day of cetirizine (Zyrtec).

Results suggested that spirulina could be an alternative therapy for the symptoms of allergic rhinitis, but larger studies are necessary.

11. Antitoxic action
A 2023 test tube study suggests that spirulina may have protective effects against metal pollutants, such as:

cadmium
lead

mercury
The authors suggested that current research shows promising results, but more studies are necessary to understand the extent of spirulina's protective benefits.

12. Supporting brain health
A 2022 review discusses the potential neuroprotective effects of spirulina. It summarizes that spirulina may have a positive effect on the activation of glial cells, which support and protect nerve cells.

Spirulina may also have benefits in the treatment of neurodegenerative conditions, such as:

Alzheimer's disease
Parkinson's disease
multiple sclerosis
However, more research in humans is necessary.

Spirulina dosage
The dosage of spirulina products in research varies from study to study. However, a 2022 review suggests a safe dose for adults is between 3 and 10 gTrusted Source daily.

People should not exceed the dose on the product label. They can speak with a healthcare professional if they have any concerns about the ideal spirulina dosage.

Does spirulina have any risks?
The 2022 review suggests that 30 g dailyTrusted Source is the maximum limit for spirulina. A 2018 review suggests that people typically tolerate spirulina well.

However, the Food and Drug Administration (FDA) does not regulate spirulina, and some studiesTrusted Source have found high levels of contaminants in spirulina products.

Exposure to these contaminants may lead to liver damage, gastrointestinal symptoms, and skin rashes, among other severe complications.

The following people should discuss spirulina supplements with a doctor before taking them:

pregnant people
older adults and children
people with weak immune systems
people taking other medications or supplements
People should also obtain spirulina and other supplements from a reputable source.

There have also been some cases of allergic reactions to spirulina. An allergic reaction can sometimes lead to anaphylaxis, a life threatening health condition that can result in anaphylactic shock.

Anyone who experiences swelling, hives, or difficulty breathing after consuming spirulina should seek immediate medical attention.

How to include spirulina in the diet
Spirulina is available in powder or tablet form.

As a powder, people can:

add it to smoothies or juices
sprinkle it on salads or in soups
mix it into energy balls
People can also take spirulina as a dietary supplement in tablet form.

Frequently asked questions
What does spirulina do to the body?
ResearchTrusted Source suggests spirulina has anti-inflammatory, antioxidant, antimicrobial, and cholesterol-lowering properties. It may have benefits for conditions ranging from gum disease to diabetes, but more research is necessary to confirm many of these uses.

How does spirulina affect weight?
A 2019 meta-analysisTrusted Source found that spirulina reduced body weight, body fat percentage, and waist circumference, particularly in people with obesity, which could make it useful as part of a weight management program. However, more research is necessary.

Is spirulina safe?
A 2022 review suggests that a safe dosage of spirulina is between 3 and 10 gTrusted Source daily for most adults.

People should always buy from a reputable source and follow the instructions on the label. Some studiesTrusted Source also highlight contamination in spirulina products, which could have adverse health effects.

Further resources
For more in-depth resources about vitamins, minerals, and supplements, visit our dedicated hub.

Summary

Spirulina contains a range of nutrients and antioxidants that may make it a suitable remedy for various diseases.

However, more research is necessary before healthcare professionals are likely to recommend spirulina as a treatment for various health conditions.

Anyone interested in using spirulina as a supplement should first speak with a doctor. They should also ensure they only purchase products from a reputable source, as there is a risk of contamination.

What Is Spirulina and Why Is It So Good for You?

Spirulina, a type of algae, has been lauded for centuries for its high nutritional value, being called, among other things, one of the “most nutrient-dense foods.” Believed to have first been used in ancient Aztec civilizations, spirulina has more recently been used as a dietary supplement for NASA astronauts on space missions.

What is spirulina?

Spirulina comes from a blue-green algae plant found in oceans and salty lakes. It’s typically sold as a powder, capsule or tablet supplement.

“Spirulina is considered one of the oldest plants on Earth,” says registered dietitian Beth Czerwony, RD, LD. “It’s been used by people for a very long time and has been shown to have some very exciting health benefits.”

You may have also heard of blue spirulina. Blue spirulina benefits are the same as spirulina but include a higher concentration of phycocyanin, an antioxidant that gives the algae its bright hue.

Spirulina benefits

There is a growing body of research supporting spirulina’s positive effects on people. Even more benefits have been shown in lab studies that may translate to humans. Czerwony says the evidence so far points to several reasons to be excited about spirulina’s health benefits.

1. It’s a powerful antioxidant

People are always raving about the antioxidant effects of blueberries, avocados, salmon and more. You can add spirulina to that list.

“Antioxidants have this wonderful ability to go in and beat up on free radicals, which are essentially poisons that we come into contact within our everyday lives,” Czerwony explains. “Antioxidants reduce inflammation in our bodies, which can decrease the chances of a whole host of diseases.”

Spirulina’s antioxidative properties are among the reasons it’s used by astronauts. (Interestingly, inflammation has been shown to be a major health risk of space life.)

2. It’s good for your heart

Spirulina's anti-inflammatory properties have been shown to have some impressive benefits for your heart. A meta-analysis shows that spirulina may improve blood cholesterol and triglycerides.

"When we think about anti-inflammatory foods, we're always thinking about heart health because we know that inflammation can lead to plaque formation and hardening of the arteries," Czerwony says. "So, if you already have high cholesterol, there's some promise that spirulina is going to help. It could also potentially be used proactively if you're at risk for heart disease."

Additional research shows that spirulina may also help reduce and prevent high blood pressure.

3. It may help relieve your seasonal allergies

If you're allergic to pollen, ragweed, animals and more, research has shown that regular use of spirulina may help relieve your runny nose.

"This is a really interesting finding because seasonal allergies are quite common, and some people don't tolerate allergy medications well or would just prefer a more holistic option to control their symptoms," Czerwony notes.

4. It may improve your dental health

Spirulina is antimicrobial and antibacterial (meaning it can kill off — or at least stop the growth of — bacteria and other invaders).

One study put its germ-killing power to the test with spirulina-laced mouthwash. Results showed people who swished with spirulina showed "significant reduction in dental plaque and gingivitis (gum disease)."

5. It may improve your workouts

There's also research around how spirulina — and its ability to reduce oxidative stress — may play a role in improving muscle strength and endurance. Another study shows that the algae may improve oxygen uptake (also known as VO2).

"Human studies have shown improvement in immunity and brain health by increasing the production of antibodies that can help ward off infection and chronic diseases," says Czerwony.

6. It may aid in weight loss

A meta-analysis of four studies shows that spirulina may aid in weight loss and reduce body mass index (BMI).

“The human studies were in conjunction with a reduced calorie intake and exercise, so it may be that spirulina has appetite suppressing abilities or it was the diet/exercise independently causing the weight loss,” explains Czerwony. “The studies are relatively small, so results should be cautiously reviewed and would warrant the need for a larger sample size.”

Spirulina side effects and risks

The U.S. Food and Drug Administration (FDA) doesn’t approve (regulate) supplements. But it does regard spirulina as “generally recognized as safe.”

If you’re looking to add spirulina to your life, you’ll want to go easy on it. It’s recommended to take no more than 8 grams of spirulina per day — that’s a little more than two teaspoons. You may experience some mild side effects like:

- Headaches
- Bloating
- Gas
- Diarrhea

But for all its promising effects, spirulina may not be a good choice for everyone, Czerwony cautions. You should talk with a healthcare provider, like your general practitioner or a nutritionist, before taking spirulina.

That’s because there are some people who should avoid spirulina or at least be wary of it. That includes people who:

- Are pregnant or breastfeeding
- Have a compromised immune system
- Have diabetes
- Have a blood disorder
- Are allergic to shellfish or other seafood
- Have an intolerance to iodine
- Are living with phenylketonuria (PKU) — a rare genetic condition where you have a buildup of the amino acid phenylalanine

Uses of spirulina

Spirulina powder can be added to your favorite smoothie, or you can try sprinkling it in your guacamole, hummus or pesto. The FDA also approves the use of spirulina as a colorant and to be used in foods like cereals and beverage mixes.

But some people are put off by the taste of spirulina, even in small amounts. Remember, it’s a sea plant, so the taste can be described as earthy or fishy, which may not be for everyone.

If the taste of spirulina isn't your jam, Czerwony suggests talking with a healthcare provider about over-the-counter spirulina supplements instead.

"Whole foods are always the preferred source of nutrients," she adds. "But if you can't tolerate the taste of it, the capsule form is a good alternative."

Bottom line?

When you consider the potential benefits of spirulina, you can see why many consider it a "superfood."

While the research is promising, Czerwony stresses that more human studies are needed to confirm spirulina's advantages. Lab studies have also considered how spirulina may:

- Improve eye health
- Improve immune health
- Improve gut health
- Support brain health
- Fight against anemia
- Reduce cancerous tumors

"Focusing on a healthy, well-balanced diet should be the first step to improve your health and decrease getting or increasing the progression of chronic disease," concludes Czerwony. "A 'food first' approach is much more effective and someone should not rely on supplementation alone."