Mushrooms: Nutritional value and health benefits

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Mushrooms are classified as vegetables in the food world, but they are not technically plants. They belong to the fungi kingdom. Although they are not vegetables, mushrooms provide several important nutrients. The key to getting enough vitamins and minerals in the diet is to eat a colorful variety of fruits and vegetables. In many cases, a food that lacks color also lacks necessary nutrients, but edible mushrooms, which are commonly white, prove quite the contrary.

This feature is part of a collection of Medical News Today articles on the health benefits of popular foods. It provides a nutritional breakdown of mushrooms and an in-depth look at their possible health benefits, how to incorporate more mushrooms into your diet and any potential health risks associated with their consumption.
Health benefits of mushrooms

Mushrooms contain some valuable nutrients.

Consuming fruits and vegetables of all kinds has long been associated with a reduced risk of many lifestyle-related health conditions.

Increasing consumption of whole, unprocessed foods, like mushrooms, appears to decrease the risk of obesity and overall mortality, diabetes, and heart disease. They also promote a healthy complexion and hair, increased energy, and overall lower weight.

1) Cancer

Mushrooms are high in antioxidants, just like carrots, tomatoes, green and red peppers, pumpkins, green beans, zucchini, and other whole foods. Antioxidants are chemicals that get rid of free radicals, a type of chemical that can harm a person's body cells, potentially leading to cancer. [https://www.cancer.gov/about-cancer/causes-prevention/risk/diet/antioxidants-fact-sheet](https://www.cancer.gov/about-cancer/causes-prevention/risk/diet/antioxidants-fact-sheet)

Selenium is a mineral that is not present in most fruits and vegetables but can be found in mushrooms. It plays a role in liver enzyme function, and helps detoxify some cancer-causing compounds in the body. Additionally, selenium prevents inflammation and also decreases tumor growth rates.

The vitamin D in mushrooms has also been shown to inhibit the growth of cancer cells by contributing to the regulation of the cell growth cycle. Placing freshly cut mushrooms in the sun significantly increases their vitamin D content. The folate in mushrooms plays an important role in DNA synthesis and repair, thus preventing the formation of cancer cells from mutations in the DNA.
2) Diabetes

Studies have shown that people with type 1 diabetes who consume high-fiber diets have lower blood glucose levels and people with type 2 diabetes may have improved blood sugar, lipids and insulin levels.

One cup of grilled portabella mushrooms and one cup of stir-fried shiitake mushrooms both provide about 3 grams of fiber. Fiber also benefits the digestive system and reduces the risk of heart disease and metabolic syndrome.

The Dietary Guidelines for Americans recommend 21 grams to 25 grams a day of fiber for women and 30 grams to 38 grams a day for men.

3) Heart health

The fiber, potassium and vitamin C content in mushrooms all contribute to cardiovascular health. Potassium and sodium work together in the body to help regulate blood pressure. Consuming mushrooms, which are high in potassium and low in sodium, helps to lower blood pressure and decrease the risk of high blood pressure and cardiovascular diseases.

Additionally, an intake of 3 grams of beta-glucans per day can lower blood cholesterol levels by 5 percent.³ The stem of the shiitake mushrooms is a particularly good source of beta-glucans.

4) Immunity

Selenium has also been found to improve immune response to infection by stimulating the production of killer T-cells. The beta-glucan fibers found in the cell walls of mushrooms stimulate the immune system to fight cancer cells and prevent tumors from forming.³
5) Weight management and satiety

Dietary fiber plays an important role in weight management by functioning as a "bulking agent" in the digestive system. Mushrooms contain two types of dietary fibers in their cell walls, beta-glucans and chitin. These increase satiety and reduce appetite. By making you feel fuller longer, they can reduce overall calorie intake.³

Nutritional profile of mushrooms

Mushrooms are naturally low in sodium, fat, cholesterol, and calories and have often been referred to as "functional foods."

As well as providing basic nutrition, they help prevent chronic disease due to the presence of antioxidants and beneficial dietary fibers such as chitin and beta-glucans.

One cup of chopped or sliced raw white mushrooms contains:

- 15 calories
- 0 grams of fat
- 2.2 grams of protein
- 2.3 grams of carbohydrate, including 0.7 grams of fiber and 1.4 grams of sugar

A large variety of mushrooms are available, but most provide around the same amount of the same nutrients per serving, regardless of their shape or size.

Vitamins and minerals

Mushrooms are rich in B vitamins such as riboflavin (B2), folate (B9), thiamine (B1), pantothenic acid (B5), and niacin B3). The B vitamins help the body to get energy from food, and they help form red blood cells.
A number of B vitamins also appear to be important for a healthy brain. Pregnant women are advised to take folic acid, or folate, during pregnancy, to boost fetal health.

Mushrooms are also the only vegan, non-fortified dietary source of vitamin D. Dairy products are normally a good food source of vitamin D, but vegans do not consume any animal products, so mushrooms can offer an alternative source of this important vitamin.

Several other minerals that may be difficult to obtain in a vegan diet, such as selenium, potassium, copper, iron, and phosphorus, are available in mushrooms.¹

Beta-glucans are a type of fiber that is found in the cell walls of many types of mushrooms. Recently, beta-glucans have been the subject of extensive studies that suggest they might improve insulin resistance and blood cholesterol levels, lowering the risk of obesity and providing an immunity boost.³

Mushrooms also contain choline, an important nutrient that helps with sleep, muscle movement, learning, and memory. Choline assists in maintaining the structure of cellular membranes, aids in the transmission of nerve impulses, supports proper fat absorption and reduces chronic inflammation.⁷

**Incorporating more mushrooms into the diet**

When buying mushrooms at the market, choose ones that are firm, dry, and unbruised. Avoid mushrooms that appear slimy or withered. Store mushrooms in the refrigerator and do not wash or trim them until ready for use.
Make stuffed portabella mushrooms by filling them with your favorite ingredients and baking.

Quick tips for preparing mushrooms:

- Sauté any type of mushroom with onions for a quick and tasty side dish
- Add raw sliced crimini mushrooms or white mushrooms to top any salad
- Make stuffed portabella mushrooms by filling them with your favorite ingredients and baking
- Add sliced mushrooms to omelets, breakfast scrambles and quiches
- Grill portabella mushrooms and use them on sandwiches or in wraps

While most of us are familiar with white or button mushrooms, other types are available.
One 19-gram shiitake mushroom, popular in Japanese cuisine, contains:

- 6 calories
- 0.09 grams of fat
- 1.29 grams of carbohydrate, including 0.45 grams of sugar
- 0.43 grams of protein
- 0.5 grams of dietary fiber

Shiitake mushrooms can be sautéed in broth or olive oil for a healthy side dish.

One whole 84-gram portabella mushroom contains:

- 18 calories
- 0.29 grams of fat
- 3.25 grams of carbohydrate, of which 2.10 grams is sugar
- 1.77 grams of protein
- 1.1 gram of dietary fiber

To enjoy a portabella mushroom, clean it, remove the stem, and marinate it in a mixture of olive oil, onion, garlic, and vinegar for an hour. Then place under a hot grill for 10 minutes.

**Potential health risks of consuming mushrooms**

Wild mushrooms have been part of the human diet for several centuries, but uncultivated wild mushrooms may pose a risk to those unable to distinguish between those safe to eat and those that are dangerous for consumption.
Eating wild mushrooms that are toxic to humans can cause severe illness and sometimes even death. Studies have also shown that some wild mushrooms contain high levels of heavy metals and other harmful chemicals.\(^5\)

To avoid these dangers, it is best to consume mushrooms that have been cultivated under appropriate conditions.

Consuming beta-glucans is believed to be safe for most people. However, since beta-glucans are capable of stimulating immune function, this may be a risk for those with autoimmune diseases such as [rheumatoid arthritis](https://www.mayoclinic.org/disease-condition/rheumatoid-arthritis/basics/what.htm), [lupus](https://www.mayoclinic.org/disease-condition/lupus/symptoms-causes/syc-20354189), [asthma](https://www.mayoclinic.org/disease-condition/asthma/symptoms-causes/syc-20368671), and [multiple sclerosis](https://www.mayoclinic.org/disease-condition/multiple-sclerosis/symptoms-causes/syc-20368659).

Researchers have yet to conclude whether or not large amounts of beta-glucan intake has any negative effects on those with these conditions.\(^5\)

It is the total diet or overall eating pattern that is most important in disease prevention and achieving good health. It is better to eat a diet with variety than to concentrate on individual foods as the key to good health.

**Further reading**

Have you enjoyed reading about the potential health benefits of mushrooms? Take a look at [our collection of articles about other foods](http://www.medicalnewstoday.com/articles/278858.php).

Alternatively, read our article about the [top 10 healthy foods](http://www.medicalnewstoday.com/articles/278858.php) for your daily diet.
Mushrooms

All mushrooms are fungi, but not all fungi are mushrooms. For those fungi that produce them, the mushroom plays a similar role to a flower or a fruit in plants. Some part of each mature mushroom produces microscopic spores that are similar to pollen or seeds, sometimes numbering in the trillions [1]. The rest of the fungal organism typically lives in the soil, wood, or some other material and is composed of thread-like strands known as mycelium. The expanding growth of the mycelium often results in circles of mushrooms or “fairy rings.” An individual mycelium can grow quite large, with at least one well-documented case covering more than 1,500 acres in Oregon [2].

Many mushroom-producing species are important decomposers, particularly of wood. These species are often relatively easy to cultivate. However, many species have a special, symbiotic, “mycorrhizal” relationship with particular species of plants. Often, neither the mushroom nor the plant will grow without a mycorrhizal partner.

Most mushroom-producing fungi are members of the phylums Basidiomycota or Ascomycota. The technical difference between these groups has to do with how the spores develop, which can be detected only by using a microscope. However, the “ascos” (ascospores) are less frequently noticed and are often shaped like small cups. Probably
the best-known ascos are the highly prized morels (genus *Morchella*), which typically fruit in the spring and are often mycorrhizal, or the true truffles (genus *Tuber*), all of which are mycorrhizal.

Some types of mushrooms that may interest you
Most of the well-known mushrooms are “basidios,” including widely cultivated species like the button mushroom (*Agaricus bisporus*), various oyster mushrooms (genus *Pleurotus*) and shiitake (*Lentinula edodes*). Popular wild edibles (which are also mycorrhizal) include the porcini (*Boletus edulis* and its relatives) and the chanterelles (genus *Cantharellus*).
Poisonous mushrooms

The common death cap (*Amanita phalloides*) or its relatives can be fatal if eaten. There are several other species that can be deadly if eaten, but all known species can be handled safely. However, relatively few mushroom species are dangerously poisonous. Many more species, including the commonly illustrated *Amanita muscaria*, can cause stomach pains, vomiting, or diarrhea. Even the popular morel is toxic if eaten raw.

A number of species, most notably some species in the genus *Psilocybe*, are psychoactive and can cause various types of hallucinations. This is considered a type of toxicity, but they are not known to have any long-term effects. However, possession of many of these species is illegal in many countries.

Medicinal mushrooms

Some species of mushrooms have been used as medicine for thousands of years, particularly in China and Japan [3]. Some of the immune-enhancing and anti-cancer effects of traditional species such as *Ganoderma lucidum* and *Trametes versicolor* have been demonstrated scientifically [4]. Regular consumption of oyster mushrooms has been shown to reduce cholesterol [5].

http://eol.org/info/453

Mushrooms have been a part of the human diet for many, many years but one question always remains: is the mushroom a vegetable? You’ve probably heard before that mushrooms are fungi, but does that mean it’s not a vegetable? Or is it both? To clear this up, we reached out to Alice Henneman, MS, RD, Extension Educator of Nutrition, Food Safety, and Cooking at the University of Nebraska-Lincoln. Alice tells us that mushrooms are technically considered fungi. Because they have no leaves, roots or seeds and don’t need light to grow, they are not a true vegetable.

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The U.S. Department of Agriculture does classify mushrooms as vegetables because they provide many of the nutritional attributes of vegetables. According to this study published in the U.S. National...
Library of Medicine National Institutes of Health, mushrooms provide nutrients that bridge across core food groups. Nutrients that can be found in produce, meat and grains can also be found in mushrooms, and they are a good source of niacin, pantothenic acid, selenium and copper providing at least 10%-19% of the daily value, and an excellent source of riboflavin providing almost 20% of the daily value. Mushrooms are also a source of potassium, dietary fiber, vitamin D and calcium, four nutrients considered underconsumed by the Dietary Guidelines for Americans.

This is great news for all mushroom lovers out there! Image: “Mushrooms” by Martin Cathrae is licensed under CC BY-SA 2.0. https://www.bestfoodfacts.org/is-the-mushroom-a-vegetable-2/

Some experts suggest that even edible, everyday mushrooms should be cooked. We consider some evidence. Dr. Andrew Weil says that all mushrooms are essentially indigestible if eaten raw because of their tough cell walls, and that to release their nutrients, they must be cooked.

Some experts suggest that even edible, everyday mushrooms should be cooked. We consider some evidence.

Dr. Andrew Weil says that all mushrooms are essentially indigestible if eaten raw because of their tough cell walls, and that to release their nutrients, they must be cooked. More importantly, he says, certain mushrooms contain small amounts of toxins, including a compound considered carcinogenic, which is destroyed through cooking because these compounds are not heat stable.

The compound in question, agaratine, is most commonly found in the mushrooms belonging to the genus Agaricus. This includes the common white or button mushroom—your everyday supermarket variety that is commonly found raw at restaurant salad bars:

- A study in the 1990s found that agaratine has a carcinogenic effect in the bladder of rats, while another study found cell mutation effects in mice that could lead to cancer.
- However, extrapolating from the study, the risk was found to be quite low—a lifetime cumulative cancer risk of about two cases per 100,000 lives.

- Other rodent studies have found that agaratine in mushrooms had no carcinogenic effects at all. Since agaratine is destroyed through cooking, the cautious consumer may wish to sauté, bake, or broil their mushrooms—the common white ones, in particular—just to be safe.

Do not, however, forgo mushrooms altogether! As Dr. Mercola points out, about 100 species of mushrooms are currently being studied for their health-promoting benefits, with a half dozen of them notable for their ability to boost the immune system. While more exotic species are used in Traditional Chinese Medicine for a variety of important conditions, even white button mushrooms can help weight management, improve nutrition, and increase your vitamin D levels.

Cordyceps mushrooms (also called caterpillar fungus) increase ATP production, strength, and endurance, have anti-aging properties, protect liver and kidneys, and can even repair damage from strokes. Shiitakes have antitumor properties, are both antiviral and antibacterial, stabilize blood sugar, and reduce atherosclerosis and cholesterol. Reishi has similar properties but is also an anti-inflammatory, an antifungal, and reduces prostate-related urinary symptoms in men.

So eat your mushrooms—but for maximum nutritional value (and to get rid of any toxicity), you might want to give them some light cooking first! You don’t need to use too much heat. Indeed, studies are showing that cooking at too high a temperature is causing health problems for us, in particular the creation of advanced glycation end-products (AGEs). Cooking at under 300 degrees seems generally safe, and of course it depends on what you are cooking. We’ll return to this interesting subject in another article.

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http://www.anh-usa.org/supermarket-mushrooms-dangerous-to-eat-raw/