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Why Mushrooms Increase Longevity

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STORY AT-A-GLANCE -

- A 2021 literature review and meta-analysis found eating 18 grams of any type of mushroom contributes to reducing your risk of cancer by up to 45%
- Ergothioneine and glutathione are two powerful antioxidants found in mushrooms. Ergothioneine cannot be found in other plants; both contribute to the prevention of cancer and neurodegenerative disease
- Shiitake mushrooms are rich in lentinan and β-glucans, which help support your immune system and have marked anticarcinogenic activity. Mushrooms may also help keep your cognitive function intact
- Take care to purchase organically grown mushrooms or grow them at home as the fungi easily absorb air and soil contaminants. Although mushroom hunting may sound fun, it can be deadly when poisonous mushrooms are misidentified

A recently published literature review[1] found eating 18 grams of any type of mushroom contributes to reducing your potential risk of cancer. Mushrooms are not plants or animals. They are umbrella-shaped fruiting bodies of a fungus that typically grows above ground.

Mushrooms produce millions of microscopic spores that are spread by animals or the wind. Once these have germinated in wood or soil, they send out a network of rooting threads called mycelium that can persist for many years.[2] Mycelium digests the surrounding nutrients externally and then absorbs those nutrients.

Scientists do not believe that all mushroom species have been identified. Neither do they agree on how many species there may be, with estimations ranging from a low of 45,000 catalogued species in 2015 to a high of 1.5 million to 5.1 million[3] yet to be discovered and named. According to a paper in the American Society for Microbiology,[4] in 2017 there were 120,000 identified species, which the researchers estimated may be just 3% to 8% of the population of mushrooms.

In ancient Egypt, **mushrooms** were thought to bring long life and have been used for centuries by Chinese medicine practitioners.[5] Greek physician Hippocrates used the Amadou mushroom for cauterizing wounds and as a potent anti-inflammatory.[6] The first people populating North America used puffball mushrooms to heal wounds.

Despite a long history of medicinal use, Western medicine has only just begun exploring the depth of benefits available in these fungi. As researchers develop methods to test individual components, they have discovered that, "Mushrooms are nature's miniature pharmaceutical factories, rich in a vast array of novel constituents and wide open for exploration."[7]

Two Mushrooms a Day May Lower Your Risk of Cancer

Researchers from Pennsylvania State University performed a literature review and meta-analysis[8] seeking to assess an association between the risk of any type of cancer and mushroom intake. They pulled data gathered from January 1, 1966, to October 31, 2020, and found 17 out of 841 identified studies that met the criteria for inclusion.

Analysis of data from more than 19,500 cancer patients[9] revealed individuals with the highest consumption of mushrooms had the **lowest risk** of any type of cancer. Importantly, there was substantial variety in the results between studies.[10]

However, researchers also found that the higher consumption of mushrooms was consistently associated with a reduction in risk in cohort studies and case-control studies when compared against those eating the least number of mushrooms.[11]

Interestingly, the scientists found a specific link between high mushroom consumption and low risk of **breast cancer**, which they wrote may be "due to the small number of studies which examined associations of mushroom intake with other site-specific cancers."[12]

The scientists reported in a press release that those who consumed 18 grams of mushrooms, or about one-eighth to one-fourth cup, daily had a 45% reduced risk of cancer. John Richie, one author and researcher at Penn State Cancer Institute, commented on the results:[13]

> *"Overall, these findings provide important evidence for the protective effects of mushrooms against cancer. Future studies are needed to better pinpoint the mechanisms involved and specific cancers that may be impacted."*

Another researcher on the team pointed out:[14]

> *"Mushrooms are the highest dietary source of ergothioneine, which is a unique and potent antioxidant and cellular protector. Replenishing antioxidants in the body may help protect against oxidative stress and lower the risk of cancer."*

Ergothioneine and Glutathione Are Potent Antioxidants

According to the U.S. Department of Agriculture,[15] on average, people eat about 3 pounds of fresh mushrooms every year and 87% of those are grown domestically. Mushrooms have a high nutrient content, providing essential minerals such as **manganese**, copper, zinc, selenium, calcium, **magnesium** and **iron**.[16]

Compared to their size and weight, they are a rich source of protein and fiber. They are high in potassium and sulfur, as well as many of the B vitamins such as riboflavin, niacin and pantothenic acid.[17]

Mushroom varieties have antioxidants that other plants or fungi do not possess, such as ergothioneine, about which one paper in the journal Molecules says, "ET [ergothioneine]

is concentrated in mitochondria, suggesting a specific role in protecting mitochondrial components, such as DNA, from oxidative damage."[18]

Mushrooms also contain unusually high levels of glutathione,[19] important for the detoxification of heavy metals and other contaminants[20] and called the "master antioxidant," as it plays a powerful role in reactivating other antioxidants.[21] As noted in The Guardian:[22]

> *"... [S]cientists think [ergothioneine and glutathione] may help to protect the body against the maladies of old age, such as cancer, coronary heart disease, and Alzheimer's disease."*

In a press release following the publication of a paper in Food Chemistry, Robert Beelman, Professor Emeritus of food science and director of the Penn State Center for Plant and Mushroom Products for Health, said:[23]

> *"What we found is that, without a doubt, mushrooms are the highest dietary source of these two antioxidants [ergothioneine and glutathione] taken together, and that some types are really packed with both of them.*
>
> *There's a theory — the free radical theory of aging — that's been around for a long time that says when we oxidize our food to produce energy there's a number of free radicals that are produced that are side products of that action and many of these are quite toxic.*
>
> *The body has mechanisms to control most of them, including ergothioneine and glutathione, but eventually enough accrue to cause damage, which has been associated with many of the diseases of aging, like cancer, coronary heart disease and Alzheimer's."*

The current study analyzed the potential relationship between mushrooms and cancer. However, Beelman has focused on the relationship with neurodegenerative conditions, pointing out that in countries like France and Italy, where people have more ergothioneine in their diet, they:[24]

"… have lower incidences of neurodegenerative diseases, while people in countries like the United States, which has low amounts of ergothioneine in the diet, have a higher probability of diseases like Parkinson's Disease and Alzheimer's.

Now, whether that's just a correlation or causative, we don't know. But, it's something to look into, especially because the difference between the countries with low rates of neurodegenerative diseases is about 3 milligrams per day, which is about five button mushrooms each day."

Shiitake Mushrooms Rich in Lentinan and β-Glucans

Shiitake mushrooms are popular and versatile in a variety of dishes. They have a rich buttery flavor, which becomes smokey when the mushrooms are dried. They're loaded with vitamins, minerals and compounds that are remarkably beneficial for your health, even though they are close to 90% water.[25]

When dried the mushrooms offer the greatest nutritional value as they are more concentrated. One nutrient is lentinans, which is an active polysaccharide that appears to enhance T helper cell function and stimulate interferon, interleukin and normal killer cells.[26]

One study in 2015[27] revealed that whole dried shiitake mushrooms could improve **human immune function**. The researchers engaged 52 healthy adults who ate up to 10 grams of the mushrooms each day for four weeks.

At the end of the study, the scientists found an increase in the proliferation of T-cells and natural killer cells and a greater ability to activate receptors. Biomarkers suggested the mushrooms improved gut immunity and reduced inflammation. Compounds in shiitake mushrooms have been found to effectively treat or protect against cancer,[28] infectious diseases,[29] inflammation,[30] and heart and liver problems.[31]

Another study showed that the lentinan and several **beta-glucans** in shiitake mushrooms exhibited "marked anticarcinogenic activity, immunity-stimulating effects and may

participate in physiological processes related to the metabolism of fats in the human body."[32]

Mushrooms Fight Cognitive Decline

Including mushrooms in your daily diet may also help **keep your cognitive functioning** intact. Research published in the Journal of Alzheimer's Disease[33] found adults who routinely ate two portions or more of mushrooms a week reduced their odds of **mild cognitive impairment** by 43%.[34]

This was independent of confounding factors such as heart disease, high blood pressure, age and alcohol and cigarette consumption. The researchers defined one portion as three-quarters of a cup of cooked mushrooms. This was meant as a guideline since the results demonstrated that even a small portion each week could be beneficial.

Ultimately, the researchers believe the reason the participants who ate two servings of mushrooms each week had a reduction in mild cognitive impairment was the result of ergothioneine, found in each of the varieties of mushrooms included in the study.[35]

Choose Organic or Grow Your Own

I highly recommend adding mushrooms to your diet as they are an excellent addition to any salad and go great with all kinds of grass fed meat and wild-caught fish. However, it is important to choose **organically grown mushrooms** as the fungi easily absorb air and soil contaminants. Growing your own mushrooms is an excellent option and likely a far safer alternative than foraging for wild mushrooms.

Although foraging may sound like fun it's vital to recognize the need for caution. Unfortunately, there are no simple rules to distinguish the difference between toxic and edible mushrooms. And, in more than 95% of cases where toxicities were reported, amateur mushroom hunters have misidentified a poisonous mushroom.[36]

The severity of the poisoning can vary, but the most toxic effects come from mushrooms containing Amanita phalloides.[37] There's no antidote for amatoxin

poisoning, so it's essential if you have any reason to suspect someone has ingested an amatoxin containing mushroom you do not wait for symptoms but seek immediate emergency treatment.

There are some medications that may help lessen the severity of the poison,[38] but they are not always successful. The most famous of the Amanita mushrooms is the lethal death cap mushroom, which may kill more people each year than any other type of mushroom.[39]

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