

What Causes Asparagus Pee?

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✓ Fact Checked

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STORY AT-A-GLANCE

- › Asparagus tends to grant human urine with distinctive odor, but only in some people, unless everyone does and only some can detect it, as the ability to smell the odd odor varies between people and populations
- › Asparagus metabolites can cause “a rather malodorous bouquet,” and there’s a link between the ability to smell asparagus pee and more than 9 million genetic variants
- › Compounds present when someone eats a healthy amount of asparagus include methanethiol, dimethyl sulfide, dimethyl disulfide and asparagusic acid
- › Not everyone produces the odor after eating asparagus, and not everyone finds it offensive, depending on their ability to actually detect the smell; in essence, some are producers and some aren’t, and some are smellers while others aren’t

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Cooking up some tasty, tender-crisp [asparagus](#) with a drizzle of balsamic vinegar and a few sprinkles of Himalayan salt is a popular side dish, and after dinner you might even find yourself sneaking a few half-warm sticks of the interesting green veggie to munch – it's that delicious.

Asparagus has its own valuable set of nutrients that make it a healthy food. There are purple (due to more anthocyanins) and white (due to thwarted chlorophyll from the absence of sunlight) varieties of this veggie, too, with slightly varying nutrient content.

However, there's an odd phenomenon that sometimes gains notoriety after a hearty serving: Asparagus has the capability of giving urine a peculiar odor like nothing else you've ever eaten. Scientists in a study of the phenomenon noted that asparagus metabolites can cause "a rather malodorous bouquet," and there's a link between the ability to smell asparagus pee and more than 9 million genetic variants.¹

It's an ancient observation, though, one noted by Stephen C. Mitchell, from the Faculty of Medicine at Imperial College London, who chronicled the history of asparagus reaching back at least to the 11th century.² It was published in *Perspectives in Biology and Medicine* and subsequently quoted by *Medical News Today*: "The Ancients thought asparagus had medicinal properties and took its odor-producing qualities as proof of its activity."³

Benjamin Franklin even noticed it, as did Louis Lémery, a French botanist who lived in the 18th century, whose quote on the subject was one for the books: Asparagus causes "a filthy and disagreeable smell in the urine, as everybody knows."⁴ What's interesting is that not everybody did know, as scientists have now figured out.

However, scientists still hadn't definitively identified the chemical compound that causes the smell, so experiments were conducted at the Harvard T.H. Chan School of Public Health in Massachusetts (as part of two long-term studies known as the Nurses' Health Study and the Health Professionals Follow-up Study) by researchers from the U.S. and Europe to get to the bottom of it.

Mitchell explains that sulfur is usually at the bottom of such a smelly conundrum; case in point: the not-so-fragrant aroma of rotten eggs. Other studies had already determined at least some of the compounds present when someone has eaten a healthy amount of asparagus: methanethiol, dimethyl sulfide and dimethyl disulfide, the first two detectable by smell when asparagus is boiled.

Scientists explain the smell is an indication that cooking could destroy them. Matthews indicates that another compound, asparagusic acid, which isn't so prone to breaking down when exposed to heat, may be the culprit. Asparagusic acid, known by scientists

by chemical moniker 1,2-dithiolane-4-carboxylic acid and thought to be present to protect tender asparagus shoots from parasites, is the "active ingredient."

What's All the Fuss About Asparagus?

Depending on where you live, you may be one of those lucky individuals who grew up gathering asparagus for dinner just by driving down country roads and spotting it growing abundantly in meadows and ditch banks. The tall, graceful stalks are bright green, like tiny, slender trunks of green palm trees, with flexible tops not unlike an inflated, purple-green wheat tassel.

When they're cut for consumption, asparagus stalks should be rinsed well, then "snapped" about one-quarter of the way up the stalk at a natural breaking point. The top three-quarters is tender enough to sauté or steam with a little natural salt so that it's tender-crisp to the bite rather than woody. (As stalks get larger and thicker, they tend to get more woody, like chewing a toothpick.)

In fact, the cooking time for asparagus is crucial, making the vegetable either delectable or pithy and unpleasant. Online chef Sarah Welch, of Dinner at the Zoo,⁵ is featured in numerous food magazines, news agencies and television programs featuring good recipes on how to cook and eat for optimal nutrition, recommends sautéing it until it's tender but not overly soft.

For me that's about three minutes, but it can vary depending on the size of the stalks and the temperature it's cooking at.

Any longer than that and not only does the enjoyable, crisp texture become mushy, turn "off-green" and bland, it also loses much of its nutritive value. It's also important to note that pencil-thin stalks cook quicker than thicker ones. Further:⁶

"If you're using thicker stalks, you may have to add a few minutes to the cook time. To make this recipe vegan, use olive oil instead of butter. Add the garlic towards the very end of the cooking time so that it doesn't burn ... sometimes I

add other ingredients that I happen to have around the house the house to spice things up a bit!"

Among the most prominent nutrients that make asparagus a uniquely healthy vegetable are vitamins K, B1, B2, C and E, plus folate, copper and selenium, but others are outstanding as well, namely fiber, potassium, phosphorus, iron, protein, zinc, manganese, pantothenic acid and vitamins B3 and B6, as well as A.

Then there's the asparagusic acid, which can be thanked (or not) for delivering what Ben Franklin called "a disagreeable odor." It turns out it's a reactive acid as it's flanked by two sulfur atoms in the molecule, which helps the acid break down rapidly. Scientists think the derivatives are what emits the smell when asparagus is eaten.

Some Produce the Smell and Some Don't

While eating asparagus may cause some people's urine to smell odd, it's a little more complex than that, because not everyone produces the odd odor after eating asparagus, and not everyone finds it offensive, depending on their ability to actually detect the smell.

In essence, there are "producers" and "non-producers," and there are smellers versus non-smellers. As Medical News Today explains, the non-sniffers have asparagus anosmia, the technical term for an inability to smell. Interestingly, the gene that makes the smell detectable has a name, too: olfactory receptor.

To figure out the inherited factors linked to the ability to smell asparagus metabolites in urine, a study⁷ involving 6,909 men and women (of European-American descent) concluded that 60% of them could be classified as asparagus anosmic – non-smellers. The study found:

- DNA differences in the way people metabolize asparagus determine whether your pee will smell like asparagus

- Some people have different abilities in regard to detecting the presence of the odor, even when someone else can
- They found that a higher proportion of women reported they were unable to detect the odor, compared to men, despite women being known to more accurately and consistently identify smells

Not Just What Goes in, but What Comes Out, Is Important

Urine serves a very important purpose for your health and well-being. It could be compared to a waste elimination plant and involves one of your most important organs: your kidneys. This filters both the fluids you drink and waste from your blood as a purifier.

Your kidneys' ability to succeed in this role is a huge determining factor for your overall health. When you think about the potential toxins introduced to your system through your diet, it gives you a new level of appreciation for the function and significance in your kidneys' ability to flush out toxins so they won't build up in your system.

Scientists estimate that in an adult's lifetime, a million gallons of water are passed through their kidneys. The urine you expel is roughly 95% water and 5% uric acid. What you eat and drink affects it; if you eat beets, for instance, your urine will likely take on a dark pink hue, not to mention the possibility of the peculiar odor after asparagus consumption.

You may even get an idea of what might be causing certain physical problems and conditions by the color and smell of your urine. It can take on a green, brown, yellow or orange tint, as well as cloudiness. In its fragrance, your urine may be reminiscent of maple syrup or even roses. Anything startlingly different may indicate something you should pay attention to or maybe even see a doctor about.

Many other things could be said about the importance of pee, but two of the crucial ones are simple: When you have to go, go. Waiting can exacerbate painful urinary tract

infections and even distension, meaning your bladder enlarges and may not return to its normal size. It's never good to hold onto toxins.

It's best to get rid of them as often as you need to. The second bit of advice is to drink plenty of pure water. A good rule of thumb to determine how much water you need is to listen to your body and let thirst be your guide. You may be surprised at how much better you feel.

Aspects of Asparagus Make It an Antioxidant Anti-Inflammatory

Not surprisingly, asparagus contains many very significant phytonutrients to benefit your health, and they reverberate throughout your body. One of the most important may be the antioxidant benefits, because they fight free radicals roaming around in your body looking for a weak place to break down your resistance and leave you open to disease.

Asparagus saponins, chemical compounds that Phytochemicals⁸ describes as glucosides with foaming characteristics found in most vegetables, as well as herbs, lead to such beneficial effects as immune system stimulation, bone loss reduction, optimized blood cholesterol by preventing its re-absorption and prevention of cancer cell growth.

Studies have shown white asparagus to be instrumental in causing colon cancer cell death,⁹ and it exerts further positive effects on combatting liver cancer by regulating apoptosis gene expression.

Asparagus extracts were also used to show its effectiveness in reducing corticosterone and lipid peroxide, two markers of chronic stress.¹⁰ According to one study, asparagus roots are the main source of a "crude" drug called shatavari, used to increase breast milk production and the appetite of lactating women, as well as for dysentery, tumors, inflammation, leprosy, epilepsy and night blindness.¹¹

That introduces another term, shatavarins, a group of steroidal saponins in asparagus, well-known in Ayurvedic medicine and modern East Indian pharmacopeia. One study notes that asparagus racemosus, a species grown in India and Asia, contains:

"Essential oils, asparagine, arginine, tyrosine, flavonoids (kaempferol, quercetin, and rutin), resin, and tannin. It is a well-known Ayurvedic rasayana which prevent ageing, increase longevity, impart immunity, improve mental function, vigor and add vitality to the body. It is also used in nervous disorders, dyspepsia, tumors, inflammation, neuropathy and hepatopathy."¹²

Studies have noted that shatavarins in asparagus contain other saponins that have a beneficial effect on inflammation by inhibiting cytokine production and messaging,¹³ and other reviews have explored how asparagus may have potential in reducing dementia-related diseases such as Alzheimer's.

How Important Is the Ability to Smell Asparagus Pee?

According to the featured study, scientists first thought those with strong-smelling urine after eating copious amounts of asparagus, as well as those who could detect the smell even if the person producing the urine could not, must reflect a genetic factor. Later, they determined that everybody secretes the odor to some degree but that not everybody could detect it. Further, they revealed the difference was due to genetic factors. According to Myths of Human Genetics:

"It is clear that there is variation in two different traits: excretion of sulfur compounds in urine after eating asparagus, and ability to smell those compounds. This means that asking people whether their own urine smells odd after they eat asparagus is not a good way to study this.

The limited amount of family data available suggests that excreting may be a simple one-gene character, with the allele for excreting dominant, but more work needs to be done."¹⁴

Sources and References

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