

# Nutrient Found in Shellfish and Energy Drinks May Extend Lifespan in Mice

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*Mussels are a rich source of taurine. Credit: Gil Ndjouwou/Unsplash*

Taurine, a chemical found in shellfish, meat and energy drinks, may extend lifespan and healthspan – the length of life spent not suffering from disease – in mice and monkeys, suggests new research. But there are important reasons why you shouldn't start stocking up on Red Bull to live a healthier, longer life.

The [study](#) is published in the journal *Science*.

## **Investigating taurine**

Over a decade ago, [Vijay Yadav](#), an assistant professor of genetics and development at Columbia University, conducted a metabolomic analysis of older adults. His aim was to identify any molecules that increased or decreased in the body as we age. Peering through the data, Yadav's colleague, [Vidya Velagapudi](#), who oversaw the screen, asked him about one striking result – a molecule that dropped 80% in old age. “What does *taurine* do?” At the time, said Yadav, his response was, “I don't have a clue.”

In 2023, Yadav, alongside a large group of researchers involved in studying the aging process, finally published a surprising answer: taurine supplements, at least in mice, extend lifespan.

Yadav's and his team started by measuring taurine levels in the rodents. As in humans, the nutrient's abundance declined with age. They then asked whether 14-month-old mice – in their middle age – would benefit from taurine supplements versus animals fed a placebo. The median lifespan extension in female mice was 12% and 10% in males. This was conducted in a gigantic animal cohort of nearly 250 mice.

### **Factbox: Where does taurine come from?**

Taurine, an amino acid, is not one of the 22 amino acids found in our genetic code, but is very commonly produced in the bodies of animals and eukaryotes. An influential [study](#) in 1975 showed that cats cannot produce enough taurine in their bodies to stay healthy and will develop a form of feline blindness if it is not supplemented in their diet. Humans do produce enough taurine to stay healthy, but nowhere near the levels attained in Yadav's study. From a dietary perspective, to hit the equivalent dose that Yadav's team fed their mice, humans would have to [gobble down](#) two kilos of roasted dark turkey meat, a

few dozen oysters or six cans of Red Bull.

Taurine supplements are also available, although Yadav, alongside his colleague Henning Wackerhage from the Technical University of Munich, said that they “do not recommend buying off the shelf taurine at the present time” due to the lack of evidence of any lifespan benefits in human clinical trials.

The scientists suggested that taurine had few risks associated with its consumption. Wackerhage pointed to a [verdict](#) by the European Food Safety Authority (EFSA) stating that the levels of taurine in energy drinks “is not of safety concern.” The EFSA also [stated](#) in 2009 that there was insufficient evidence to back any health claims surrounding taurine. There has yet to be any formal studies of the effects of consuming very high levels of taurine every day over a lifespan, as the mice in the current study did. Wackerhage said the team did not want to “aggressively market” their results, although Yadav was quoted as saying that “taurine could be an elixir of life within us that helps us live longer and healthier lives,” in a [press release](#).

This increase in lifespan, said the authors, indicates that declining taurine levels are a driver of the aging process. Tests on a subset of the animals once they reached 24 months –old age in mice– showed that the nutrient also appears to produce a glut of physiological bonuses. Supplemented mice had improved skeletal and grip strength, glucose balance, coordination and even lowered anxiety and enhanced memory. There were even benefits at a cellular level – taurine-fed mice had less damaged DNA and their cells showed improved metabolism and a better ability to sense nutrients.

## **Too good to be true?**

The picture was so positive, said Yadav, that he wondered whether it was “too

good to be true". He enlisted a battalion of fellow anti-aging researchers to investigate taurine's effect in a series of other well-studied organisms used in research. In *C. elegans* worms, supplemental taurine extended lifespan. In old rhesus macaque monkeys, six months of taurine supplementation reduced bodyweight gain. It also had beneficial impacts on bone and liver health, immune system balance and blood glucose. No lifespan studies were conducted in the primates, who live for over 20 years and are prohibitively expensive to study over longer periods. The only model organism that taurine didn't benefit was unicellular yeast, suggesting taurine's effects on metabolism may have diverged at a relatively early evolutionary timepoint.

The multi-billion-dollar question, however, is whether taurine can perform these feats in humans. Answering this definitively will require lengthy clinical trials, but Yadav pointed to some initial data his team amassed that he said gives hope the findings will be consistent. An analysis of data from 12,000 older European adults showed that higher taurine levels were associated with health benefits such as a lower risk for type 2 diabetes and obesity, improved blood pressure and less inflammation. These associative findings are unable to establish a causal relationship, so further study will be required.

## **"An exciting time for aging research"**

Interestingly, they also explored whether a non-dietary intervention known to boost health – strenuous exercise – could increase taurine. After pedaling their subjects to exhaustion on a stationary bike, the team found that both athletes and less active people had increased taurine levels.

Taurine isn't the first chemical to be proposed as a potential "elixir of life". Rapamycin, a drug used to prevent organ rejection and coat heart stents, has been [shown](#) to boost mouse lifespan after just three months of treatment. "I think it's just a really exciting time for aging research," said Yadav. "In my view, there are many molecules which are going onto human intervention trials, including

rapamycin, metformin and NAD analogs, and we hope to put taurine on the same list.”

**Reference:** Singh P, Gollapalli K, Mangiola S *et al.* Taurine deficiency as a driver of aging. *Science*. 2023; 380:eabn9257. Doi: [10.1126/science.abn9257](https://doi.org/10.1126/science.abn9257)

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