

# Food for thought: Study finds link between depression and unhealthy diets

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A Macquarie University study of 169 adults aged 17 to 35 found those eating a Western-style diet were more likely to have lower levels of kynurenic acid (KA)—a small molecule important to a number of bodily functions—and report higher levels of depression than those eating diets rich in fresh fruit and vegetables.

Neuroscientist Dr. Edwin Lim and neuropsychologist Dr. Heather Francis, both Society for Mental Health Research Fellows, together with psychologist Professor Richard Stevenson, have published a paper on the findings of the study in the journal *Frontiers in Nutrition*.

"Western-style diets high in fat, sugar and processed foods were already known to increase the risk of [depression](#), but this is the first time a biological link involving the kynurenine pathway has been established," Lim says.

"In this study, we tested participants' urine for several biological markers, including KA and inflammation, and compared them with how healthy their [diet](#) was and the severity of

depression symptoms.

"People from the group eating an unhealthy diet had lower levels of KA and more severe symptoms of depression. This indicates that KA may help to protect us against depression."

The [human body](#) has a number of ways of producing important molecules and metabolites necessary to keep it functioning.

One of these important molecules is [tryptophan](#)—an [essential amino acid](#) that the body can't make itself, that is found in foods like dairy products, poultry, bananas, oats, nuts and seeds.

## What is KA and why is it important?

Our bodies break down tryptophan into metabolites that are used to regulate behavior, protect the brain, and control inflammation, which is linked to diseases including some cancers, heart disease, stroke and dementia.

When tryptophan is broken down, it can produce either serotonin and melatonin—important for our mood and sleep—or it can be processed by the [kynurenine pathway](#), which creates KA and other important metabolites linked to neurodegenerative diseases such as Alzheimer's disease.

Lim says this is the first time anyone has been able to show that Western-style diet has an effect on the way that tryptophan is metabolized in otherwise healthy young people.

"Previously, it was believed that changes to tryptophan metabolism were driven by inflammation, despite there not being conclusive clinical evidence for this," he says.

"Our study also shows that urine analysis may be a useful alternative to blood tests in collecting valuable biological information on the way our

bodies process tryptophan.

"This can be a big advantage in that it's not only simpler—it's less invasive, which is important for vulnerable people such as children and older adults."

Dr. Heather Francis, senior lecturer in Clinical Neuropsychology in the School of Psychological Sciences at Macquarie University, says it's too early to say whether targeting KA might be an option one day for treating depression, in a similar way that we increase serotonin using antidepressants.

"There is, however, a clear relationship between an increased risk of depression and eating an unhealthy diet that is high in fat, sugar and processed foods, giving us all the incentive to eat more fresh vegetables and fruit," she says.

As with most metabolites, the level of KA in the body is important. Too little is associated with depression, but too much has been linked to schizophrenia.

There is clearly a [sweet spot](#), but scientists do not yet know what it is, or what other aspects—like an individual's genetic make-up—might have an influence.

Factors like [physical activity](#) are also at play, as people who report getting regular exercise do tend to also have healthy levels of KA.

**More information:** Heather M. Francis et al, Kynurenic acid as a biochemical factor underlying the association between Western-style diet and depression: A cross-sectional study, *Frontiers in Nutrition* (2022). [DOI: 10.3389/fnut.2022.945538](https://doi.org/10.3389/fnut.2022.945538)

Provided by Macquarie University

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