

Long term high-fat diet expands waistline and shrinks brain

8 July 2022, by Candy Gibson



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New research shows that fatty foods may not only be adding to your waistline but also playing havoc with your brain.

An international study led by UniSA neuroscientists Professor Xin-Fu Zhou and Associate Professor Larisa Bobrovskaya has established a clear link between mice fed a [high-fat diet](#) for 30 weeks, resulting in diabetes, and a subsequent deterioration in their [cognitive abilities](#), including developing anxiety, depression and worsening Alzheimer's disease.

Mice with impaired cognitive function were also more likely to gain excessive weight due to poor metabolism caused by brain changes.

Researchers from Australia and China have published their findings in *Metabolic Brain Disease*.

UniSA neuroscientist and biochemist Associate Professor Larisa Bobrovskaya says the research adds to the growing body of evidence linking chronic obesity and diabetes with Alzheimer's disease, predicted to reach 100 million cases by

2050.

"Obesity and diabetes impair the central nervous system, exacerbating psychiatric disorders and cognitive decline. We demonstrated this in our study with mice," Assoc Prof Bobrovskaya says.

In the study, mice were randomly allocated to a standard diet or a high-fat diet for 30 weeks, starting at eight weeks of age. Food intake, body weight and [glucose levels](#) were monitored at different intervals, along with glucose and insulin tolerance tests and cognitive dysfunction.

The mice on the high-fat diet gained a lot of weight, developed insulin resistance and started behaving abnormally compared to those fed a standard diet.

Genetically modified Alzheimer's disease mice showed a significant deterioration of cognition and pathological changes in the brain while fed the high fat diet.

"Obese individuals have about a 55 percent increased risk of developing depression, and diabetes will double that risk," Assoc Prof Bobrovskaya says.

"Our findings underline the importance of addressing the global obesity epidemic. A combination of obesity, age and diabetes is very likely to lead to a decline in cognitive abilities, Alzheimer's disease and other mental health disorders."

More information: Jing Xiong et al, Long term high fat diet induces metabolic disorders and aggravates behavioral disorders and cognitive deficits in MAPT P301L transgenic mice, *Metabolic Brain Disease* (2022). DOI: [10.1007/s11011-022-01029-x](https://doi.org/10.1007/s11011-022-01029-x)

Provided by University of South Australia

APA citation: Long term high-fat diet expands waistline and shrinks brain (2022, July 8) retrieved 4 September 2022 from <https://medicalxpress.com/news/2022-07-term-high-fat-diet-waistline-brain.html>

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