

Low-fiber diet may lead to gut infection even if you're not overweight

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Diet, more than body mass, may play a role in the risk for gut infection, and eating more fiber could be the key to prevention. The study is published ahead of print in the *American Journal of Physiology-Endocrinology and Metabolism*.

Obesity is associated with developing [chronic conditions](#) such as type 2 diabetes, [heart disease](#) and fatty liver disease. Previous research suggests being overweight can also raise the risk and severity of bacterial [infection](#). However, less is known about whether following a [diet](#) that tends to cause [obesity](#) is enough to increase bacterial infection risks without being obese.

Researchers from Canada examined the effects of diet and obesity on a mouse model of a bacterial infection caused by excess adherent-invasive Escherichia coli (AIEC) in the intestinal tract. AIEC is a microorganism that may cause harm only under certain circumstances. People who have the inflammatory bowel disorder Crohn's disease may have too much AIEC (called an expansion) in their digestive tract, which can be exacerbated by antibiotic use. Previous studies have found that obesity and related factors, such as a high-fat and [high-sugar diet](#), may change the composition of the gut microbiome enough to increase the risk of inflammation and infection. The typical Western diet containing highly processed foods also tends to be low in fiber. However, it's not clear if this type of diet is enough to predispose people to bacterial infection.

Obese [mice](#) followed two high-fat (60% and 45% fat), low-fiber diets. All of the animals developed AIEC expansion in the colon. The mice on the 60% fat diet had a higher body mass than those eating the 45% fat chow, but there was no significant difference in the amount of AIEC

(AIEC burden) in their systems. "These data suggested that an aspect of diet composition rather than the magnitude of host obesity was sufficient to promote intestinal AIEC expansion," the researchers wrote.

The research team fed lean mice a [high-fat diet](#) on a short-term basis before significant obesity occurred to explore the effect of diet on AIEC burden. After the animals were exposed to AIEC, the lean mice eating the high-fat diet had more AIEC expansion than the controls (lean mice on a normal diet). These results "indicate that diet can regulate AIEC infectious burden independent of changes in [body mass](#) leading to obesity," the researchers wrote. Finally, the research team found that mice on a low-fat, low-fiber diet had higher AIEC burden than those eating a normal diet, suggesting that dietary fat was not the key ingredient, but "ingestion of lower dietary fiber is sufficient to promote expansion of AIEC throughout the gut."

One takeaway from this study is that people who are leaner may have similar risks of gut infection if they don't eat enough fiber. "Our data show that dietary fiber is a standalone factor," the researchers wrote.

"Low dietary fiber promotes enteric expansion of a Crohn's disease-associated pathobiont independent of obesity" is published in the *American Journal of Physiology-Endocrinology and Metabolism*.

More information: Trevor C. Lau et al, Low dietary fiber promotes enteric expansion of a Crohn's disease-associated pathobiont independent of obesity, *American Journal of Physiology-Endocrinology and Metabolism* (2021). [DOI: 10.1152/ajpendo.00134.2021](https://doi.org/10.1152/ajpendo.00134.2021)

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