

Low-calorie diet may be harmful for bowel disease patients

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In a surprising result, Michigan State University researchers looking at the effects of diet on bowel disease found that mice on a calorie-restricted diet were more likely to die after being infected with an inflammation-causing bacterial pathogen in the colon.

While research suggests inflammation associated with obesity may contribute to inflammatory bowel diseases such as colitis, the study results revealed a low-calorie diet may actually impair the immune system's ability to respond to infection, said Jenifer Fenton, assistant professor in the Department of Food Science and [Human Nutrition](#).

Additionally, the study found no connection that moderate obesity increased the severity of colitis in the mouse model.

"The results are similar to the research from our department that shows consuming fewer calories make it harder to fight off the [flu virus](#)," said Fenton, referring to recent work by colleague Elizabeth Gardner. "Since this is a totally different pathogen, it amplifies the need to find out why [caloric intake](#) has such an impact on the body's ability to respond to infection.

"It is possible that the same mechanism that happens with the flu is occurring with gastro-intestinal diseases; future research will ask this very question."

The research is published in the current edition of the *World Journal of*

Gastroenterology.

[Inflammatory bowel disease](#), or IBD, is a group of conditions affecting the colon and intestines; the major types being [ulcerative colitis](#) and Crohn's disease. People suffering from IBD have an increased risk of developing [colon cancer](#).

As part of their study, Fenton and colleagues evaluated the influence of obesity and calorie-restricted diets on mice with induced colitis.

Mice in the study were given one of three dietary treatments: a high-fat diet, a 30 percent caloric-restriction diet and a control group on an average-caloric diet. They then were treated with bacteria called *H. hepaticus*, which infects the colon and causes inflammation, eventually leading to tumor development. This process models the more aggressive lesions observed in human colon cancer cases.

Unexpectedly, study results suggest increased body fat induced by a high-fat diet did not influence the severity of colitis, despite changes in hormones that are known to increase with obesity and influence inflammation. In fact, researchers found calorie-restricted mice had a higher mortality rate in response to infection with *H. hepaticus*, dying before tumors even developed.

"Future studies should examine the association between body fat percentage and immune responses to infections leading to inflammatory bowel diseases," Fenton said. "Understanding how a low-calorie [diet](#) increases mortality in this model may lead to new treatments for the disease in humans."

Provided by Michigan State University

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