

Females respond poorly to ketogenic weight loss diet in an animal model

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The ketogenic diet recently has been touted for weight loss and improving blood sugar control, but a new study finds that females fail to show these metabolic benefits on this high-fat, very low-carbohydrate

diet. Results of the animal study will be presented Sunday at the Endocrine Society's annual meeting in New Orleans, La.

"Our findings in mice suggest that females on the [ketogenic diet](#) are less likely than males to experience significant fat loss and are more likely to exhibit impaired [blood sugar control](#)," said study lead investigator Jesse Cochran, a research assistant at the University of Iowa in Iowa City, Iowa. "These results may help explain discrepancies in this [diet](#)'s success rates across the sexes."

Originally used as a treatment for epilepsy, the ketogenic diet, which is sometimes called the keto diet, greatly restricts consumption of carbohydrates (starches, sugars and fibers) and proteins. This makes the body switch from burning carbohydrates for energy, which it does naturally, to burning stored fat. The liver converts fat to ketone bodies in a process called ketosis.

"Most studies of the ketogenic diet for weight loss have taken place in small numbers of patients or in only male mice, so sex-based differences in response to this diet are unclear," said senior investigator E. Dale Abel, M.D., Ph.D., chair of the University of Iowa Department of Internal Medicine and president-elect of the Endocrine Society.

Working under Abel's supervision, Cochran studied both male and female mice. He fed them either a ketogenic diet or a regular diet as a control. The control diet consisted of 7 percent fat, 47 percent carbohydrates and 19 percent protein by mass, whereas the keto diet was 75 percent fat, 3 percent carbohydrates and 8 percent protein by mass. After 15 weeks of feeding, the female mice on the ketogenic diet displayed no changes in weight and had impaired blood sugar control compared with females on the control diet, he reported. In male mice, however, [body weight](#) decreased on the ketogenic diet while blood sugar control was maintained. However, males on the ketogenic diet displayed

signs of worsened [non-alcoholic fatty liver disease](#).

Speculating that estrogen plays a role in the differing response to the ketogenic diet, Cochran removed the ovaries of some female mice and tested both diets. Compared to mice fed a control diet, ovariectomized mice on a ketogenic diet had decreased body weight and body fat.

"This finding suggests that [postmenopausal women](#) could potentially experience better [weight loss](#) outcomes with the ketogenic diet compared to younger women," Cochran said.

Abel recommended that people considering a ketogenic diet discuss it with their doctor or a dietitian first, noting that some feel worse while on this diet or have trouble sticking to it.

Provided by The Endocrine Society

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