

Ketogenic diets may lead to an increased risk of type 2 diabetes, study in mice says

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New research published in the *Journal of Physiology* indicates that ketogenic diets, which are low carbohydrate high fat eating plans that are known to lead to weight loss, may cause an increased risk of Type 2 diabetes in the early stage of the diet.

Type 2 diabetes is one of the most pressing challenges of our time and its ultimate cause has not been fully understood. Ketogenic diets, which are low in carbohydrate and high in fat, are known to lead to weight loss and have been considered to be healthy. These findings raise new questions about ketogenic diets and whether or not they are actually healthy.

Insulin is released in the blood and used to control blood sugar levels including signaling the liver to stop producing sugar. If this system is impaired and the body does not use insulin properly, which is called [insulin resistance](#), individuals are likely to develop high blood sugar levels. In this study the researchers showed that for ketogenic diets this process for controlling [blood](#) sugar levels does not work properly and there was insulin resistance in

the liver. When the liver is unable to respond to normal levels of insulin to control [blood sugar levels](#) this may lead to an increased risk of Type 2 diabetes.

The study, which was conducted by ETH Zurich in conjunction with University Children's Hospital Zurich, involved feeding mice two different types of diet (a ketogenic diet and a high fat diet, which causes the liver to become resistant to insulin) and then performing standard metabolic tests on them. Using specialized procedures the researchers were able to determine the effects of internal sugar production from the animal (mostly the liver), and [sugar](#) uptake into tissues (mostly the muscle), during insulin action.

It is important to note that the research did not analyze whether the diet employed causes obesity, if given long term. The mechanism behind the whole process was undetermined; therefore, the existence of a shared physiological response between low carb and regular carb high fat diets that cause insulin resistance in the [liver](#) requires further exploration.

Christian Wolfrum, one of the corresponding authors on the paper said 'Diabetes is one of the biggest health issues we face. Although ketogenic diets are known to be healthy, our findings indicate that there may be an increased risk of [insulin](#) resistance with this type of [diet](#) that may lead to Type 2 diabetes. The next step is to try to identify the mechanism for this effect and to address whether this is a physiological adaptation. Our hypothesis is that when fatty acids are metabolized, their products might have important signaling roles to play in the brain.'

More information: Short term feeding of Ketogenic Diet induces more severe Hepatic Insulin Resistance than obesogenic High Fat Diet, *Journal of Physiology* (2018). [DOI: 10.1113/JP275173](https://doi.org/10.1113/JP275173)

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