

Dietary leucine may fight prediabetes, metabolic syndrome

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A study led by researchers at the Joslin Diabetes Center suggests that adding the amino acid leucine to their diets may help those with pre-diabetes or metabolic syndrome.

In an animal study, published in the journal *PloS One*, mice who had been on a high-fat [diet](#) and who also received twice the usual intake of leucine, an amino acid found in protein, showed reductions in their prediabetic conditions with lower blood sugars and less fat in their livers, two of the collection of [medical problems](#) associated with [insulin resistance](#) that make up what is known as [metabolic syndrome](#).

"The impact on the animals on the high-fat diet, even though it didn't change how fat they got, was that their bodies were able to handle glucose better," said C. Ronald Kahn, M.D., Head of the Joslin Section on Integrative Physiology and Metabolism and the Mary K. Iacocca Professor of Medicine at Harvard Medical School. Kahn led the team of researchers from Joslin and Metabolon Inc. of Durham, N.C.

"Their glucose tolerance tests improved," he said. "Their bodies responded to insulin better than they would have before they got the leucine. It improved their ability to metabolize sugar and fats. It markedly improved their pre-diabetic condition. Their metabolic syndrome also improved."

Mice who were fed a normal diet and given leucine showed no significant effects from taking the [dietary supplement](#).

Kahn said the study sought to see what effect just a small change in their environment -- in this case in just one small component of the diet -- might have on animals with prediabetes or metabolic syndrome.

"We found that adding just this one amino acid to the diet changed the metabolism in a lot of different pathways," he said. "It had effects that improved [insulin sensitivity](#), improved their ability to metabolize sugar and fats and their overall [metabolism](#) improved."

Kahn said the study, funded by the National Institutes of Health, shows that even small changes in how we interact with our environment can make a big difference. Such changes can be positive or negative. In this case, they were positive.

He said it is too soon to recommend that those with prediabetes or metabolic syndrome add leucine to their diets, but said the next step should be a study in humans.

Leucine is one of 22 [amino acids](#) that serve as building blocks of proteins. It was chosen to be tested because in vitro studies had previously shown that it has effects on insulin signaling, Kahn said. Leucine is found in all protein food sources. It is often taken in supplements by those involved in body building in order to increase muscle mass.

Provided by Joslin Diabetes Center

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