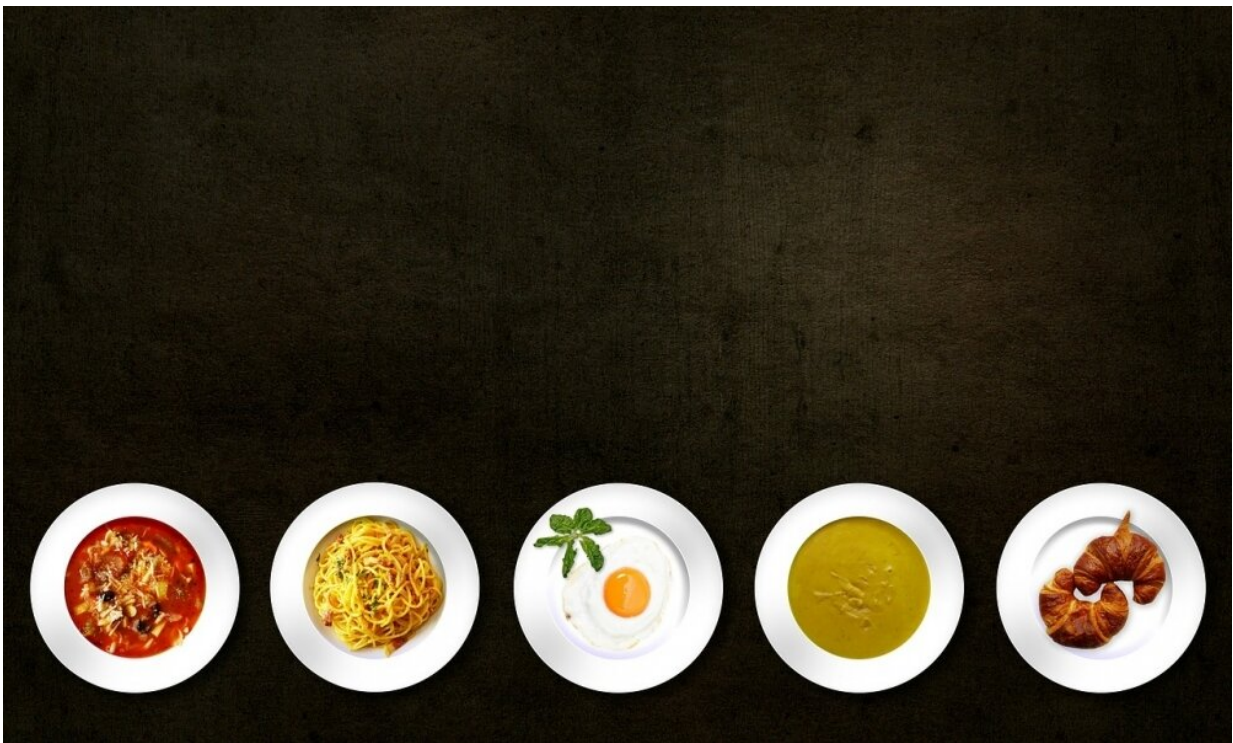


# Protein restriction can be effective in combating obesity and diabetes, study suggests

September 20 2022, by Maria Fernanda Ziegler

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Twenty-one patients with metabolic syndrome were given a calorie or protein restriction diet in a randomized clinical trial by Brazilian and Danish researchers. Weight loss, controlled blood pressure and improved blood sugar and lipid levels were observed in all participants. Credit: Pixabay

Cutting protein intake can help control metabolic syndrome and some of

its main symptoms, such as obesity, diabetes and high blood pressure (hypertension), according to a study conducted by researchers in Brazil and Denmark to compare the effects of protein and calorie restriction diets in humans. An article reporting the study is published in the journal *Nutrients*.

Metabolic syndrome is a cluster of conditions that heighten the risk of cardiovascular disease, stroke and diabetes, including hypertension, high blood sugar, excess body fat around the waist and abnormal cholesterol levels.

"The study showed that cutting [protein intake](#) to 0.8 g per kg of body weight was sufficient to achieve almost the same clinical results as restricting calories, but without the need to reduce [calorie intake](#). The results suggest that protein restriction may be one of the key factors leading to the known benefits of dietary restriction. Protein restriction dieting may therefore be a more attractive nutritional strategy and easier to follow for people with metabolic syndrome," said Rafael Ferraz-Bannitz, first author of the article and currently a postdoctoral researcher at the Joslin Diabetes Center in Harvard Medical School in the United States.

A multidisciplinary team of scientists conducted the study, including researchers affiliated with the University of Copenhagen in Denmark, and the University of São Paulo and the National Cancer Institute (INCA) in Brazil, as well as the Obesity and Comorbidities Research Center (OCRC), a Research, Innovation and Dissemination Center (RIDC) supported by FAPESP and hosted by UNICAMP.

## **Controlled diet**

In the study, 21 volunteers with metabolic syndrome were analyzed for a period of 27 days during which their diet was monitored. Throughout the

period, they were inpatients at FMRP-USP's teaching hospital (Hospital das Clínicas in Ribeirão Preto).

Each volunteer's daily calorie intake was calculated as a function of baseline metabolism (energy expenditure at rest). One group was fed what the authors call a standard Western diet (50% carbohydrate, 20% protein and 30% fat) but with 25% fewer calories.

For the second group, protein intake was reduced to 10%. Calorie intake was tailored to each volunteer's baseline energy expenditure. Both groups consumed 4 g of salt per day.

The results showed that both the calorie and protein restriction groups lost weight owing to a decrease in body fat and that the symptoms of metabolic syndrome improved. Decreased body fat is known to be associated with reduced blood sugar and more normal levels of lipids and blood pressure.

"After 27 days of monitoring, both groups had similar results in terms of lower blood sugar, weight loss, controlled blood pressure, and lower levels of triglycerides and cholesterol. Both diets improved insulin sensitivity after treatment. Body fat decreased, as did waist and hip circumference, but without loss of muscle mass," said Maria Cristina Foss de Freitas, last author of the article and a professor at FMRP-USP.

The findings confirmed those of previous studies involving experiments on mice. "Here, however, we succeeded in conducting a fully controlled [randomized clinical trial](#) lasting 27 days, with a personalized menu designed to meet each patient's needs," Foss de Freitas said.

Manipulation of dietary macronutrients—protein, carbohydrate and fat—is sufficient to obtain the beneficial effects of dietary restriction. "We demonstrated that protein restriction reduces body fat while

maintaining muscle mass. That's important since the [weight loss](#) resulting from restrictive diets is often associated with loss of muscle mass," Ferraz-Bannitz said.

The study did not investigate the [molecular mechanisms](#) that could explain the beneficial effects of protein restriction diets, but the researchers believe low protein intake triggered a change in the metabolism or enhanced the organism's energy management by leading it to burn fat in order to produce energy for cells.

"We only have hypotheses so far. One is that molecular pathways are activated to interpret the reduction in essential amino acids as being a signal to reduce food intake while leading to the production of hormones that typically increase when we're fasting," Mori said. "Studies in animal models have shown the involvement of such pathways in the effects of both protein and calorie restriction, both of which lead to fat loss."

Despite the promising results of their studies, the researchers point out that the diets involved were personalized. Mori also stressed that they focused on a specific population of patients with metabolic syndrome (obesity, diabetes, hypertension and abnormal levels of cholesterol).

"Nevertheless, it's tempting to extrapolate the results. We know research has shown vegan diets to be positive for cases of [metabolic syndrome](#). It's also been found that the excessive protein intake common in the standard Western diet can be a problem. Every case should be analyzed on its own merits. We shouldn't forget protein deficiency can lead to severe health problems, as has been well-described in pregnant women, for example," he added.

**More information:** Rafael Ferraz-Bannitz et al, Dietary Protein Restriction Improves Metabolic Dysfunction in Patients with Metabolic Syndrome in a Randomized, Controlled Trial, *Nutrients* (2022). [DOI:](#)

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