

High-protein Diets Increase Risk Of Developing Kidney Disease In Rats

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Image Caption: University of Granada research group 'AGR-145: Digestive Physiology and Nutrition', including the researchers who conducted this experiment. Credit: University of Granada

University of Granada

An experiment by scientists at the University of Granada, Spain, shows a high-protein diet increases the chance of developing kidney stones and other renal diseases

High-protein diets, like the popular [Dr. Dukan diet](#), increase the long-term risk of developing kidney disease and have a negative effect on renal urinary and morphological markers. What's more, they may promote serious pathologies like nephrolithiasis (calcium kidney stones) because they drastically reduce urinary citrate (an inhibitor of calcium salt crystallization) and urinary pH, and increase urinary calcium (to compensate for the metabolic acidity caused by excess protein).

University of Granada scientists have proved this in an experiment in rats that examined the effects of a high-protein diet on renal urinary, plasma and morphological parameters.

The researchers studied 20 Wistar rats, divided into two groups of 10. The first group were fed a high-protein diet of commercial hydrolysed protein supplements with a 45% protein level. The control group were fed a normal protein diet. The experiment lasted 12 weeks, which is the equivalent of 9 years in human terms.

10 per cent weight loss

The results showed that the rats on a high-protein diet lost up to 10% of their body weight over the 12 weeks with no improvement in their plasma lipid profile. Moreover, urinary citrate in these rats was 88% lower and urinary pH was 15% more acidic. In the animals fed a high-protein diet, kidney weight increased by 22%, glomerular area—the network of capillaries that filter blood in the kidneys—by 13%, and the mesangium—a collagen structure surrounded by these capillaries—by 32%.

The results of this study lead the principle author, Dr Virginia A. Aparicio of the University of Granada Department of Physiology, to stress the need to closely monitor anyone on a high-protein diet. The Dukan diet, and others like it, can have serious long-term adverse effects on their health.

She warns that the negative effects of high-protein diets on the kidney also depend on the presence of other nutrients in the diet. “Eating large amounts of fruit and vegetables reduces the risk of kidney stones forming—probably due to their high potassium and magnesium content, which compensates for the acidity of the high-protein diet”, Dr Aparicio concludes.

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