

# High-protein diets reduce liver fat

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All study participants benefited from the high-protein diet (photo: lentils).  
Source: DIfE

According to a new nutritional study conducted by the German Institute of Human Nutrition (DIfE) on individuals with type 2 diabetes, high-

protein diets reduced liver fat by up to 48 percent within six weeks. It did not matter whether the diet was mainly based on plant or animal protein. The team of scientists led by Mariya Markova, Olga Pivovarova, Silke Hornemann and Andreas F. H. Pfeiffer of DIfE, a partner of the German Center for Diabetes Research (DZD), has now published its findings in the journal *Gastroenterology*.

Nonalcoholic fatty liver disease is the most common [chronic liver disease](#) in Europe and the U.S. "When left untreated, fatty liver is an important step progress to type 2 diabetes and can develop into liver cirrhosis, which can have life-threatening effects," said endocrinologist Andreas F. H. Pfeiffer of DIfE, who led the study. "Since the number of affected persons is increasing, it is therefore more important than ever to work together with our partners to develop effective dietary strategies that prevent the disease," he added.

Various studies throughout the world have already investigated the effects of high-protein diets on human metabolism. In many of these studies, scientists have observed beneficial effects on body weight, liver fat content, blood lipid levels, long-term blood glucose levels and muscle mass retention. However, some studies have also concluded that high protein intake can reduce insulin activity and affect renal function. Since both positive as well as negative effects have been observed, the researchers at DIfE posed the question whether the protein source was decisive for the respective effect. Therefore, in the current study, they investigated the effects of two high-protein diets\* on the metabolism of 37 female and male subjects between the ages of 49 and 78 years suffering from type 2 diabetes and, in most cases, from fatty liver. The two diets differed only in the protein sources, which were either mainly plant or animal origin. To ensure that the weight of the participants remained stable during the entire study and that any weight loss could not influence the result, the scientists individually adjusted the energy content of the diet to each individual. The scientists randomized which

of the two diet forms each participant should follow. The main source for the plant protein group were foods such as noodles or bread that were enriched with pea protein and were especially prepared by the company IGV Institut für Getreideverarbeitung GmbH. The [animal protein](#) group consumed lean milk products as well as white meat and fish as protein sources.

"As our results show, all [study participants](#) benefited from the high-protein diet, whether based on plant or animal protein. Negative effects on renal function or glucose metabolism were not observed," said first author Markova. "Liver fat content decreased significantly, in half of the study participants by more than 50 percent. In conjunction with this, we observed favorable changes in the liver and lipid metabolism, improved insulin sensitivity of the participants and in addition a significant reduction in the hormone fibroblast growth factor 21 in the blood," added Olga Pivovarova, who along with Mariya Markova and Silke Hornemann coordinated the current study. The function of the hormone released by the liver into the blood has not yet been adequately clarified and thus the results are not easy to interpret, according to the scientist. However, previous studies have shown that the hormone affects different organs and adipose tissue. Especially in overweight people, high concentrations are found in the blood. According to Silke Hornemann, a physician involved in the study, other studies as well as their own studies suggest that the hormone concentration also depends on the type and quantity of the consumed macronutrients.

"Larger and longer studies are needed to better understand the metabolic mechanisms underlying the observation, to study the long-term effects, and to see whether also younger patients would benefit from the change in diet," said Pfeiffer. "The favorable effects we observed in the study may also be age-dependent, because the study participants were on average older than sixty years of age. If no renal disease is present, sufficient protein supply plays an important role particularly in this age

group. For example, a decrease in muscle mass is often associated with age," Pfeiffer added. Further research is still needed to elucidate the hormonal regulation mechanisms involved. In conclusion, however, it can be said that from the observations and taking into account environmentally relevant aspects, consumers should preferably rely on plant foods for their protein source.

**More information:** Mariya Markova et al, Isocaloric Diets High in Animal or Plant Protein Reduce Liver fat and Inflammation in Individuals with Type 2 Diabetes, *Gastroenterology* (2016). [DOI: 10.1053/j.gastro.2016.10.007](https://doi.org/10.1053/j.gastro.2016.10.007)

\*In both diets, the respective protein content contributed 30 percent to the energy supply. The proportion of carbohydrate intake amounted to 40 percent, and fats amounted to 30 percent of the energy supply. In addition, the nutritionists advised both groups to maintain an equal intake of saturated, mono- and polyunsaturated fatty acids. Prior to the change in diet of the study participants the protein content of their diet contributed an average of 17 percent to the energy supply, the carbohydrate content 42 percent and fat content 41 percent.

Foods such as lean meat, fish, eggs and low-fat dairy products are very rich in protein, as are legumes (e.g. peas, beans, lentils), nuts and almonds. According to the German Nutrient Database (Bundeslebensmittelschlüssel), 100 grams of roast turkey breast contain 25.2 grams of protein, and 100 grams of dried green peas contain 22.9 grams.

The German Society of Nutrition (DGE) recommends for adults a daily intake of 0.8 grams of protein per kilogram of body weight. That means for a body weight of 60 kilograms, for example, 48 grams of protein per day. (Source: DGE).

Provided by Deutsches Zentrum fuer Diabetesforschung DZD

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