# Trends in Medical Research

ISSN 1819-3587

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# More Protein, Less Refined Starch Important for Dieting, Large Study Shows

***Researchers at the Faculty of Life Sciences (LIFE), University of Copenhagen, can now unveil the results of the world's largest diet study: If you want to lose weight, you should maintain a diet that is high in proteins with more lean meat, low-fat dairy products and beans and fewer finely refined starch calories such as white bread and white rice. With this diet, most people can also eat until they are full without counting calories and without gaining weight.***

Finally, the extensive study concludes that the official dietary recommendations are not sufficient for preventing obesity.

The large-scale random study called "Diogenes" has investigated the optimum diet composition for preventing and treating obesity. The results were recently published in the New England Journal of Medicine.

The objective of the Diogenes study has been to compare the official dietary recommendations in Europe, including the Danish recommendations, with a diet based on the latest knowledge about the importance of proteins and carbohydrates for appetite regulation. A total of 772 European families participated, comprising 938 adult family members and 827 children. The overweight adults initially followed an 800 kcal/day diet for eight weeks, losing an average of 11 kg. They were then randomly assigned to one of five different low-fat diet types which they followed for six months in order to test which diet was most effective at preventing weight regain. Throughout the project, the families received expert guidance from dieticians and were asked to provide blood and urine samples.

**The five diet types**

The design comprised the following five diet types:

- A low-protein diet (13% of energy consumed) with a high glycemic index (GI)*
- A low-protein, low-GI diet
- A high-protein (25% of energy consumed), low-GI diet
- A high-protein, high-GI diet
- A control group which followed the current dietary recommendations without special instructions regarding glycemic index levels

**A high-protein, low-GI diet works best**

A total of 938 overweight adults with mean body mass index (BMI) of 34 kg/sq m were initially placed on an 800-kcal-per-day diet for eight weeks before the actual diet intervention was initiated. A total of 773 adult participants completed this initial weight-loss phase and were then randomly assigned to one of five different diet types, where 548 participants completed the six-month diet intervention (completion rate of 71%).

Fewer participants in the high-protein, low-GI groups dropped out of the project than in the low-protein, high-GI group (26.4% and 25.6%, respectively, vs. 37.4%; P = 0.02 and P = 0.01 for the two comparisons, respectively). The initial weight loss on the 800-kcal diet was an average of 11 kg.

The average weight regain among all participants was 0.5 kg, but among the participants who completed the study, those in the low-protein/high-GI group showed the poorest results with a significant weight gain of 1.67 kg. The weight regain was 0.93 kg less for participants on a high-protein diet than for those on a low-protein diet and 0.95 kg less in the groups on a low-GI diet compared to those on a high-GI diet.

**The children's study**

The results of the children's study have been published in a separate article in the American Medical Journal of Pediatrics. In the families, there were 827 children who only participated in the diet intervention. Thus, they were never required to go on a diet or count calories -- they simply followed the same diet as their parents. Approx. 45% of the children in these families were overweight. The results of the children's study were remarkable: In the group of

Children who maintained a high-protein, low-GI diet the prevalence of overweight dropped spontaneously from approx. 46% to 39% -- a decrease of approx. 15%.

**Proteins and low-GI foods ad libitum -- the way ahead**
The Diogenes study shows that the current dietary recommendations are not optimal for preventing weight gain among overweight people. A diet consisting of a slightly higher protein content and low-GI foods ad libitum appears to be easier to observe and has been documented to ensure that overweight people who have lost weight maintain their weight loss. Furthermore, the diet results in a spontaneous drop in the prevalence of overweight among their children.

**About glycemic index**
The glycemic index is a measure of the ability of carbohydrates to increase blood glucose levels when absorbed in the body. Food with a low-glycemic index (LGI) causes blood glucose levels to increase more slowly and to lower levels compared to high-carbohydrate foods with a high glycemic index

Drastic increases in blood glucose levels give rise to several potentially undesirable effects that can influence the body's metabolism as well as our ability to perform mentally. It is therefore most appropriate to maintain a diet that results in slow digestion and thus more stable blood glucose levels and greater satiety.

A diet with high protein content contains many protein-rich foods such as lean meat, poultry, fish, eggs and low-fat dairy products. Legumes also contain high levels of protein, as do nuts and almonds. Proteins are significantly more filling than both carbohydrates and fat.

**Special requirements for a low-glycemic diet**
The glycemic index applies to carbohydrate-containing foods. The recommendations are that some types of fruit may be consumed ad libitum, such as apples, pears, oranges, raspberries and strawberries. Other types should be eaten in only very limited amounts, including bananas (especially overripe bananas), grapes, kiwi, pineapple and melon. Nearly all vegetables are permitted, with the exception of corn, which should be limited. Carrots, beets and parsnip should preferably be eaten raw.

With regard to cereal-based foods (bread, grain, corn, hulled grains and breakfast products), the goal is to eat as many coarse and wholegrain foods as possible, i.e. wholegrain breads with many kernels, wholegrain pasta, whole oats and the special varieties of wholegrain cornflakes.

Potatoes should be cooked as little as possible. Try to stick to new potatoes, and it is a good idea to eat them cold. Avoid mashed potatoes and baked potatoes.

"Pasta should be cooked al dente and is best eaten cold".

Choose rice varieties such as brown rice, parboiled rice or basmati.

White bread without kernels, white rice and sugary breakfast products should be avoided. In general, sugar intake should be limited, not so much because of its GI but to avoid all those 'empty calories'.

**Recommended GI values:**
Over 70 -- high GI 55-70 -- medium GI under 55 -- low GI

High-GI foods can still be healthy and vice versa. Carrots, for instance, have a high GI (72), while chocolate has a low GI (49). Fats help decrease the absorption of sugar in the blood, which means that carbohydrate-containing foods and fat can have a low GI.

**Example of a day's menu for a high-protein, low-GI diet**
If you want to maintain a high-protein, low-GI diet, daily meals could be composed as follows:

**Breakfast:** Low-fat A38 yogurt with muesli (without added sugar), wholegrain crispbread with low-fat cheese, an orange

**Morning:** Vegetable sticks and low-fat cheese sticks

**Lunch:** Wholegrain rye bread with lean meat or chicken cold cuts, mackerel in tomato sauce and misc. Vegetables

**Afternoon:** Wholegrain rye bread with low-fat liver pâté and cucumber

**Dinner:** Stir-fried turkey with vegetables and wholegrain pasta; avocado salad with feta cheese and sugar peas

It is best to drink water or low-fat milk with meals.

To sum up, there is nothing particular about this diet with the exception of the above-mentioned limitations, special cooking instructions and the fact that certain vegetables should be eaten raw. This diet generally complies with the official dietary recommendations of eating plenty of fruit and vegetables, low-fat foods, plenty of fibre and limiting sugar intake.

The study was conducted by eight European research centres and headed by Thomas Meinert Larsen, PhD, and Professor Arne Astrup, DrMedSc and Head of Department at the Faculty of Life Sciences (LIFE) and is funded by an EU grant of EUR 14.5 million.

**Editor's Note:** This article is not intended to provide medical advice, diagnosis or treatment.