Low-fat diet 'better' than low-carb diet for getting rid of body fat - National Library of Medicine

Behind The Headlines - Health News from NHS Choices

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"Low-fat diets 'better than cutting carbs' for weight loss," says BBC News. But wait, the Mail Online says: "Low-carb 'is best for weight loss". Confused?

Traditionally, weight-loss diets were based on the concept of eating a low-fat diet. But in recent years the idea of low or no carbohydrate diets, such as the Atkins diet, have become popular.

A new diet lab rigorously enforced either a low-carbohydrate or low-fat diet for 19 obese men and women over six days. The six-day low-carb diet led to more weight loss than a low-fat diet, but the low-fat diet led to more fat loss. And losing fat tissue is generally better for your health. This means both the BBC and Mail Online are technically correct.

The study was small, short term, and the diets were quite extreme. This makes them less relevant to most people's everyday life or efforts to lose weight. They aren't convincing enough to settle the low-carb versus low-fat diet debate.

But you could argue the whole low-fat versus low-carb debate is a needlessly overcomplicated distraction from what should be four simple words of advice – eat less, exercise more.

The principle of combining physical activity with reduced calorie consumption is at the core of the NHS Choices weight loss plan – a sustainable way to lose weight without relying on any gimmicks.

Where did the story come from?

The study was carried out by researchers from the US National Institutes of Health and was funded by the same organisation.

It was published in the peer-reviewed science journal Cell Metabolism on an open-access basis, so it is free to read online or download as a PDF (PDF, 1.7Mb).

The BBC and Mail Online ended up with opposite headlines based on the same study. The BBC went with "Low-fat diets 'better than cutting carbs' for weight loss", while the Mail Online said that, "Low-carb 'is best' for weight loss".

This confusion is understandable. The low-fat diet led to more fat loss – the outcome the study was most interested in – but the low-carb diet led to more weight loss overall.

The researchers argue fat loss was more important to the obese people in this study for long-term weight loss. This implies the weight loss achieved in the low-carb diet was not down to fat loss. Although this wasn't stated in the study, you can lose weight via losses in muscle and water.

Both the BBC and the Mail carry a useful quote from an independent expert, Professor Susan Jebb, who rightly says: "The best diet for weight loss is the diet you can stick to". So outside of the highly restricted diet lab, the bigger issue of weight loss is how to stick to a diet in the long term.

What kind of research was this?

This human laboratory study looked at the way two short-term diets – one low in fat, one low in carbohydrates – affected a person's metabolism and any weight loss.

Your body gets energy from two main sources: by burning fat and carbohydrate. Both are regulated by the hormone insulin. Popular weight-loss diets often advise cutting down either fat or carbohydrates, but there is debate about which works best.

This study wasn't focused on weight loss, but was geared up to investigate how diet influences how the body burns fat and carbohydrate. The researchers highlighted past randomised control trials showing greater short-term weight loss in obese patients on low-carb diets.

But they say there are problems with these studies, meaning we don't know if they help you lose weight by changing your metabolism for the better – lowering insulin levels and causing more fat burning and energy expended as a whole – or simply make you eat less overall.

Low-carb diets can be higher in protein and fat, which are filling, making you eat less. This wasn't the case in this study.

What did the research involve?

The study confined 19 obese adults (9 men, 10 women) to a "metabolic ward", or diet lab, for two two-week periods while on low-fat or low-carb diets. While in the diet labs, researchers meticulously monitored and restricted their diets, energy intake and expenditure, and used a host of biological measures to establish whether they were burning fat or carbohydrates as their source of energy.

Each person spent five days in the diet lab on an energy-balanced diet (50% carbohydrate, 35% fat, 15% protein) before being randomly assigned to a diet that slashed their calorie intake by 30% (around 800 calories a day lower) for a further six days. This was achieved either through a 60% reduction in carbs (low-carb diet) or an 85% reduction in fat (low-fat diet).

Throughout the six days they had no access to additional food or drink, and even meetings with visitors were watched by nurses or researchers to catch any potential cheating.

After a two- to four-week washout period where they could eat what they liked, volunteers were readmitted to

try the other diet. This repeated the five-day balanced diet followed by the alternate six-day low-fat or low-carb diet.

Some physical activity was controlled – they all had to do 60 minutes of walking on a treadmill each day – and the rest was monitored using portable activity monitors worn on the hip.

The study excluded those who had large weight change (more than 5kg) in the past six months, had diabetes, were menopausal, were pregnant or breastfeeding, or had mobility problems.

Two men dropped out of the study after the first stint on the low-carb diet, so did not contribute data to the subsequent low-fat diet part of the study.

What were the basic results?

Both diets led to weight loss over the six days, but those on the low-carb diet lost significantly more. After six days the low-carb group had lost about 1.85kg on average compared with around 1.3kg on the low-fat diet, around a half kilo difference in just six days.

The low-carb diet led to significant changes in metabolic fuel selection. Insulin levels dropped, which lowered carbohydrate burning by around 500 calories a day and increased fat burning by around 400 calories a day. "Remarkably", as the researchers put it, fat burning didn't change fuel selection – both fat and carb burning remained unchanged.

That said, the low-fat diet resulted in a greater body fat loss compared with the low-carb diet, despite being equivalent in calories. Short-term fat loss was measured as the difference between the amount of fat taken in and the amount of fat burnt (as measured by biological testing) in the diet lab – this isn't the usual way.

The normal measurements, percentage body fat or fat mass, didn't change between the groups. The authors used the short-term measure because the study was too short to influence body fat percentage or fat mass.

The team built a mathematical model to predict changes in metabolism and body weight before the study was conducted. They adapted the model using the data collected and predicted what would happen in the future. The model accurately predicted the results of the short-term diets and predicted small long-term differences in body fat.

How did the researchers interpret the results?

The researchers say that, "Calorie for calorie, restriction of dietary fat led to greater body fat loss than restriction of dietary carbohydrate in adults with obesity. This occurred despite the fact that only the carbohydrate-restricted diet led to decreased insulin secretion and a substantial sustained increase in net fat oxidation compared to the baseline energy-balanced diet."

They added: "We can definitively reject the claim that carbohydrate restriction is required for body fat loss", saying that, "Fat loss is a more important goal than weight loss in the treatment of obesity" and that outside of

the highly controlled diet lab "diet adherence is likely the most important determinant of body fat loss".

Conclusion

This well-designed diet lab study showed that a six-day low-carbohydrate diet affects a person's metabolism far more than a low-fat diet. The low-carb diet led to more fat burning and overall energy expenditure via lower insulin levels, whereas the low-fat diet didn't alter fat or carb-burning proportions, but led to more fat loss.

The study was well designed and rigorous, but included only 19 people and lasted only a few weeks. This is a small number of people, and a short amount of time, on which to base any generalisations about most people. The results aren't convincing enough to settle the low-carb versus low-fat diet debate.

The diets were pretty extreme and rigorously enforced under diet lab supervision. Sticking to a diet that cuts energy intake by a third, including fat intake by 85%, would be a big challenge for people outside of the diet lab.

But these large changes were necessary to elicit a measureable effect in the short time the researchers had available – they weren't meant to be directly applicable to outside life. Smaller changes over the long term might work equally well, something the researchers' mathematical modelling attempted to predict.

The researchers did make the point that the low-carb diet they were investigating wasn't a low-carb diet in the traditional sense. They kept carbs at 140g a day, when traditional low-carb diets are said to contain less than 50g per day.

But to do this they would have had to increase fat and protein intake to balance out calorie intake, which they didn't want to do as they wanted to look at the sole effect of reducing carbs.

This again highlights that making overall conclusions on the effects of low-fat or low-carb diets in general is not possible outside the strictly controlled and specific dietary composition used in this study.

Professor Susan Jebb, Professor of Diet and Population Health at the University of Oxford, hits the nail on the head, saying: "The real challenge for science is not the nutritional composition of the diet, but the behavioural strategies to promote adherence.

"All diets 'work' if you stick to an eating plan that cuts calories, whether from fat or carbohydrate, but sticking to a diet is easier said than done, especially given the prolonged time it takes to lose weight."

Starchy foods high in carbohydrate should make up around one-third of everything we eat. This means we should base our meals on these foods. Read more about a balanced diet.

Want to lose weight without resorting to gimmicks? The NHS has a tried-and-tested weight loss plan.