# Low-Carb, Low-Fat Diet Gurus Face Off

Joan Stephenson, PhD

LAST SUMMER, AN ARTICLE IN THE July 7 *New York Times Sunday Magazine* challenged conventional thinking about weight loss, questioning the efficacy of low-fat diets and sparking a resurgence of interest in so-called high-protein or low-carbohydrate diets.

In this issue of *JAMA* (page 1837), a systematic review of studies published between 1966 and February 2003 on the safety and efficacy of low-carbohydrate diets finds that there is insufficient evidence to recommend or advise against the use of such diets, and that weight loss was associated with length of the diet, prediet weight, and the number of calories consumed, but not reduced carbohydrate content.

*JAMA* asked proponents of low-carbohydrate and low-fat diets, and an obesity researcher who has explored many interventions, to comment on weight loss approaches and the obesity epidemic.

## LOW-CARBOHYDRATE DIETS

Perhaps the most visible proponent of a low-carbohydrate diet is Robert C. Atkins, MD, a New York City cardiologist and chairman of the Dr Robert C. Atkins Foundation. In his books, Atkins recommends a program that restricts the amount of carbohydrates in the diet, particularly during the initial phase, when carbohydrates comprise less than 10% of total calories eaten. People on this plan tend to consume 40% or more of their calories in fat, compared with the average US diet of about 30% fat calories.

In a recent conversation, *JAMA* discussed low-carbohydrate diets with Atkins and Colette Heimowitz, MS, director of education and research at Atkins Health & Medical Information Services.

*JAMA: Why have there been relatively few studies of low-carb diets in the past 30 years?*

**Dr Atkins**: It's just a speculation, but I think people did not want to fund [such studies] because they had already made a statement that everybody should be on a low-fat, high-carbohydrate diet. But there have been about 7 or 8 studies that have been done just in the past 2 or 3 years.

*JAMA: What kind of findings emerged from these studies?*

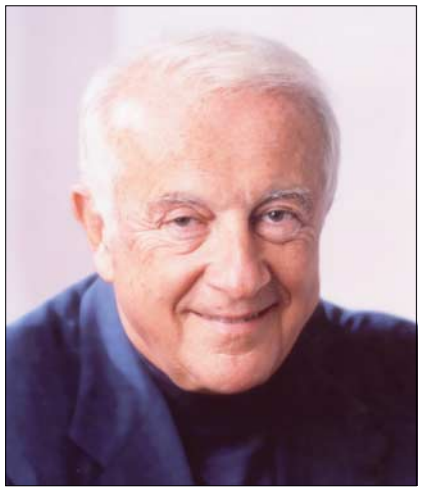
**Ms Heimowitz**: Sixth-month results from a Duke University study [of 120 patients] commissioned by the Atkins Foundation that compared a low-carbohydrate diet with a low-fat one were recently presented [at the American Heart Association's annual scientific sessions last November by Eric Westman, MD, of Duke University]. On the low-carb diet, the weight loss was more pronounced and triglycerides plummeted another 50% when compared to low-fat; HDL [high-density lipoprotein cholesterol levels] increased while it just went up minimally on the low fat; and the LDL [low-density lipoprotein cholesterol levels] remained normal.

*JAMA: Why are you critical of the low-fat approach?*

**Dr Atkins**: Over the last 30 years, we've seen two epidemics [emerge], obesity and diabetes. The problem is that the low-fat diet turned out to be high in refined carbohydrates, although [proponents] didn't intend it to be.

Some claim that Americans have been eating more fat today than they were before, but studies have shown that the intake of fat 30 years ago was 40% of the diet and the fat intake of fat just a few years ago was 32% of the diet. But other studies have shown that the intake of sugar has gone up more than 30 pounds per person per year in the past 30 years. Even worse, and this correlates with the [United States Department of Agriculture's] food pyramid, there was a 64.3 pound increase in flour and other grain products—refined carbohydrates.

*JAMA: Many have expressed concerns about long-term safety of a low-carbohydrate diet, such as the effects of calcium loss on bone, or whether the relatively high protein content might be a problem for people who have a propensity to form kidney stones.*



Ken Collins

Robert C. Atkins, MD

**Dr Atkins**: We've never seen it. But nobody's done a study on long-term use of any diet.

**Ms Heimowitz**: Concerns come from the initial water loss in the first few days when there's a slight shift in pH and a slight loss of electrolytes, but that quickly returns to baseline. That's why taking a multivitamin and potassium citrate and drinking adequate water is very important in the induction phase, when about 35% of calories are from protein, to counteract and side effects of the [initial] rapid weight loss.

**Dr Atkins**: By the third and fourth week people go back to the same degree of water retention that they had at the beginning. So this is a short-term effect.

*JAMA: Others have raised concerns about the effect of the higher fat content of the Atkins diet.*

**Dr Atkins**: There's not a single study [to substantiate] the things that are said to be bad about our diet—such as fats are dangerous or saturated fats are dangerous. When the carbohydrate content is low, the fat takes a different metabolic pathway and forms energy

through ketones, which then gets burned up right away. So the ketones do not accumulate because they're being used for energy.

### VERY LOW-FAT DIETS

One of the best-known proponents of a very low-fat diet is Dean Ornish, MD, founder and president of the Preventive Medicine Research Institute, Sausalito, Calif. Ornish advocates a very low-fat (10% of total calories) and plant-based diet. Research by Ornish and his collaborators found in a study of 48 patients with moderate to severe coronary artery disease that a very low-fat diet and other lifestyle changes resulted in weight loss and regression in coronary atherosclerosis (*JAMA*. 1998; 280:2001-2007).

*JAMA: Why do you think there's a controversy regarding the merit of low-fat diets vs low-carbohydrate diets?*

**Dr Ornish:** Part of the myth that started with the [*New York Times Sunday Magazine]* article last summer is that 'Americans have been . . . eating fewer percentage of calories of fat than ever, yet they're fatter than ever—therefore fat is not the problem.' But that's a distortion of the truth. It's true that the percentage of calories from fat [Americans are now eating] is a little lower, but the absolute amount of fat that people are eating is actually higher than ever. The only reason the relative proportion or percentage of fat is lower is because they're eating even more simple carbohydrates.

*JAMA: What are your concerns about that approach?*

**Dr Ornish:** The goal is not to go from simple carbs like sugar, high-fructose corn syrup, white flour, white rice and alcohol to bacon and sausage and brie, but to go from simple carbs to complex carbs, because things like brown rice, fruits, vegetables, whole grains, legumes in their natural forms are rich in fiber. Fiber fills you up before you get too many calories and it slows the absorption of the food, so you don't get that rapid rise in blood sugar, you don't provoke an insulin response.

Ken Probst

**Dean Ornish, MD**

That means you get the benefit of the high-protein diet from the standpoint of avoiding the insulin surges, but you also get the added benefit of eating foods that are less dense in calories, because the high-protein diets are often high in fat. You also get the added benefit of reducing your intake of disease-promoting substances such as saturated fat, dietary cholesterol, and oxidants, while increasing your intake of ones that are protective—an alphabet soup of phytochemicals, carotenoids, lycopene—[substances] that with few exceptions are found fruits, vegetables, grains, beans, and soy products.

*JAMA: You been critical of recent reports of studies that have claimed that an Atkins-style low-carbohydrate diet produced a lipid profile as favorable as that of a control group following a low-fat diet. What are your concerns?*

**Dr Ornish:** One [problem] is that it's important to measure underlying disease and not just risk factors. What concerns me is that for the most part, the studies that have been done on the Atkins diet only look at risk factors like weight and lipids, predominantly triglycerides. There's no peer-reviewed data indicating that an Atkins-style diet can reverse coronary heart disease. In our studies, we have 5 years of data, not only weight loss data but also underlying disease measures using state-of-the-art measures of heart disease, quantitative arteriography, and cardiac PET scans.

The other problem is that in most of these studies of low-carbohydrate diets, none of the comparison diets are very low in fat or simple carbohydrates, which biases the results in favor of the low-carb, high-protein diets. The study Westman presented at the American Heart Association compared the Atkins diet with the AHA diet [comprising about 30% fat], and it also gave fish oil and flax seed oil, which lower triglyclerides, only to participants on the Atkins diet.

Simple carbohydrates don't fill you up and get absorbed quickly, so they cause a rapid spike in blood glucose, which in turn produces an insulin surge that lowers blood sugar. It also stimulates the conversion of the calories into triglycerides or fat, and stimulates HMG-CoA reductase—the enzyme that the statin drugs are designed to inhibit—and so has an adverse effect on lipids.

*JAMA: Why do you think that people haven't heard the message that they should be mindful of simple carbohydrates as well as dietary fat?*

**Dr Ornish:** The USDA pyramid has not made that distinction [between complete and simple carbohdrates], and that may be part of the problem.

### LOOKING AT THE BIG PICTURE

Thomas Wadden, PhD, professor of psychology and director of the weight and eating disorders program at the University of Pennsylvania, has investigated interventions for treating obesity, including behavior modification, very low-calorie diets, exercise, and drug therapy, as well as psychosocial consequences of obesity and the behavioral and metabolic effects of dieting and weight cycling.

*JAMA: What is the current thinking on the low-carbohydrate approach to weight loss?*

**Dr Wadden:** The low-carbohydrate diets can undoubtedly produce weight loss. They do so, however, by restricting calories. I doubt that being on a low-carbohydrate diet has any metabolic advantage over being on a high-carbohydrate, low-calorie diet. I think

calories ultimately determine whether people lose weight or not.

*JAMA: Dr Atkins and other proponents of the low-carb approach say that it's not true that a calorie is a calorie, that some studies comparing isocaloric low-carbohydrate and low-fat diets have found that people lose more fat on the low-carb diet.*

**Dr Wadden:** I think that Dr Atkins and his colleagues selectively recite the literature. Most of the studies that have been well conducted using isocaloric diets in which the carbohydrate content is manipulated show essentially the same weight loss when you control for calorie content. Macronutrient intake doesn't seem to make a difference in terms of weight loss.

There are multiple controlled studies, particularly those by Alain Golay [of the University of Geneva, in Switzerland], where he has taken people and put them on isocaloric diets but manipulated the carbohydrate content, that found the weight losses are the same. So calories do count.

*JAMA: Is there something distinctive about how people experience a low-carbohydrate diet?*

**Dr Wadden:** People on low-carb diets often say they don't feel hungry. My own guess is that people are less hungry because they're eating large amounts of dietary protein, the most satiating of the three macronutrients. Secondly, they're avoiding contact with other foods. When you reduce your food choices, appetite declines.

The Atkins people and others say it's ketosis. But in fact, if you compare ketogenic and nonketogenic diets at the same calorie levels, there's no difference in appetite control between them. So it's not a matter of ketosis conferring incredible appetite regulation.

*JAMA: Are there any specific health concerns about a low-carb approach to weight loss, such as calcium loss, effects on the kidney, or blood lipids?*

**Dr Wadden:** I don't think we have sufficient evidence at this point; I think we need long-term studies to show what happens when you're consuming a low-carb, high-fat diet for a long period of time. On a short-term basis, I suspect that the Atkins diet is associated with reductions in weight and in triglycerides, probably in insulin, and maybe in glucose. My biggest concern would be what happens with the LDL cholesterol component.

David Wadden

**Thomas Wadden, PhD**

But I think the real question is whether this diet is better than other reducing diets in facilitating long-term weight control, and there's just no evidence that it is.

Another general concern is missing out on fruits and vegetables. There's clearly a large body of evidence saying they they're good in protecting us from diseases. And you're missing out on fiber in the Atkins diet.

*JAMA: What is the thinking on the very low-fat approach that Dr Ornish recommends?*

**Dr Wadden:** It's just extremely hard for most people to adhere to. People have to be extremely vigilant if they're going to adhere to a diet in which only about 10% of calories comes from fat.

If I were choosing between the two, I'd be more inclined to go to a low-fat, high-carb diet than a low-carb, high-fat diet, because people can eat large quantities of fruits and vegetables, which should provide good satiety. There's a whole body of research that shows that at least on a short-term basis, people eat by the volume or weight of the food they consume, so you want to eat foods that are very heavy, rich in water—like fruits and vegetables.

I think Ornish's plan is unrealistic for most Americans trying to lose weight, but I would have fewer health concerns about his diet than I would about the low-carb, high-fat diets.

*JAMA: Would you be concerned that adherence difficulties of this approach would cause some people to become discouraged and abandon attempts to lose weight?*

**Dr Wadden:** Yes, very much so. It sets people up—as does the Atkins plan—for having good and bad foods, and you're likely to stray.

*JAMA: Why is it so extraordinarily difficult for people to maintain weight loss?*

**Dr Wadden:** I think it's because they're swimming against the tide of a fattening American lifestyle. We have patients come into our clinic for one hour a week, but their TV set has them 20 hours a week advertising high-fat foods, as do magazines and newspaper ads.

I think most of the obesity epidemic is environmental. The environment has changed dramatically, and obesity is a natural response to this fattening environment. I think the two biggest culprits are large portion sizes that induce people to eat more than they need to, and sedentary activities resulting from changes in our ways of making a living and enjoying ourselves. Most of us are probably expending 200 to 300 calories fewer per day than we did 25 years ago, just from simple introductions, like the computer.

*JAMA: What kinds of solutions are needed?*

**Dr Wadden:** We have to think more about environmental interventions and public policy, from changes in school lunch programs to making environments where there are sidewalks and playgrounds. Obesity is a very complex social problem as well as a medical problem. □