



ARTHUR S. AGATSTON, MD

Agatston Research Institute, Miami Beach, FL;
Dr. Agatston, a preventive cardiologist, is author
of the *South Beach Diet* and developed the
Agatston calcium score

The end of the diet debates? All fats and carbs are not created equal

ABSTRACT

The key to healthy eating is choosing “good fats”—foods high in omega-3 fatty acids and unsaturated fats, and “good carbohydrates”—foods high in fiber and having a low glycemic index. The healthiest diet is the Mediterranean type, consisting of lean meats, fish, nuts, vegetables, whole fruits, and whole grains.

KEY POINTS

The modern American diet is radically different from the one our ancestors ate during millions of years of evolution. It has led to today's epidemic of obesity, insulin resistance, and coronary artery disease.

The low-fat, high-carbohydrate diet recommended by the American Heart Association leads to insulin resistance.

The high-fat, low-carbohydrate diet advocated by Atkins leads to a loss of lean body mass and is dangerously high in saturated fats.

THE PUBLIC is confused about what constitutes a healthy diet: should it be low-fat or low-carb? I believe there is now a consensus among professionals that the healthiest diet consists of “good” fats, “good” carbohydrates, fruits, vegetables, and lean protein.

This article discusses how diet has changed from that of early humans, how the modern American diet contains an excess of refined carbohydrates and leads to insulin resistance and a cycle of overeating, and how to make healthy food choices to achieve weight loss and better health.

LOW-FAT, HIGH-CARB DIETS UNSUCCESSFUL

In the 1980s, Keys et al¹ compared industrial societies and less-industrialized countries and concluded that diets high in fat and low in carbohydrates were to blame for coronary artery disease. This led to the initial food pyramid and the American Heart Association guidelines, emphasizing predominantly carbohydrates and only a small amount of fats.

Since then, there has been an upswing in obesity, metabolic syndrome, and diabetes.^{2,3} An estimated 64% of the US population is classified as overweight or obese,⁴ and about 40% of Americans older than 40 years have prediabetes.

Unfortunately, the American Heart Association adopted its low-fat, high-carbohydrate guidelines without subjecting them to a long-term clinical trial. Most trials of these diets have not been able to show weight loss or improved lipid profiles.^{5,6} The Oslo trial⁷ did show positive health outcomes from a low-fat diet, but results were confounded because fish consumption and smoking cessation were

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greater in the intervention group.

Statin trials may provide the most unbiased evidence for low-fat, high-carbohydrate diets. Subjects in placebo groups are usually regularly counseled to eat a traditional National Cholesterol Education Program/American Heart Association step 1 diet (total fat $\leq$ 30% of total calories, saturated fat $\leq$ 10% of total calories, cholesterol $<$ 300 mg/day). Typical results initially show a slight decrease in serum low-density lipoprotein cholesterol (LDL-C) concentrations, then a return to baseline levels.

New concepts explain failure

Several important concepts in nutrition developed only in the past few decades: fiber, the glycemic index, the metabolic syndrome, *trans*-fats, the nutrient density of foods, “good fats,” and “good carbohydrates.”

These concepts help explain why the low-fat, high-carbohydrate diet experiment failed. We now know that not all low-cholesterol foods are healthy, especially many “diet” desserts that are made of processed carbohydrates and *trans*-fatty acids.

■ INSULIN RESISTANCE

When people eat a lot of simple carbohydrates they crave more soon afterwards, creating a vicious circle. Simple carbohydrates cause plasma glucose levels to rise abruptly, triggering insulin secretion. Insulin allows glucose to enter fat and muscle cells, causing hypoglycemia.

When blood sugar falls below baseline levels, food cravings start. High-fiber foods, like whole grain bread, cause a smoother rise in blood sugar and a subsequent slower decline, so hunger does not resume for 4 to 6 hours.

Other factors heighten the glycemic response, making bigger peaks and faster drops in blood sugar. People in middle age tend to gain visceral fat, which is metabolically different from subcutaneous fat, resulting in a larger glycemic response. In addition, as people gain weight, visceral adipocytes enlarge, making them metabolically more active and also harder for insulin to attach to receptors, enhancing insulin resistance.

Insulin resistance also adversely affects

the lipid profile. A normal liver efficiently metabolizes very-low-density lipoprotein (VLDL) particles by lipoprotein lipase to large LDL (pattern A), the less harmful subtype. Insulin resistance leads to a less efficient fatty liver, because postprandial clearance of free fatty acids from the blood is not as effective, and the fatty acids accumulate in the liver. A fatty liver creates malformed VLDL particles that cannot be metabolized well by lipoprotein lipase, resulting in the production of atherogenic remnants. At the same time, high-density lipoprotein (HDL) particles are altered. These factors tend to decrease the total cholesterol level, which helps explain why people with a serum cholesterol concentration of less than 200 mg/dL are still at risk.

The ‘thrifty gene’ theory

The “thrifty gene” theory holds that for early humans to best survive, the body had to efficiently store fat during times of plenty. Accumulating fat in the abdomen enabled people to still run and hunt fairly well.

A slower metabolism also conserves energy during famine. Unfortunately for modern dieters trying severe calorie restriction, weight loss is great initially, but lean body mass declines and lowers metabolism along with fat. When people start eating their usual diets again, they often end up heavier than they started.

People vary in how rapidly they develop insulin resistance. Groups such as the Pima Indians had subsistence living conditions until recently and have very “thrifty” genes. They now have extremely high rates of obesity and type 2 diabetes mellitus, even in children.

American diet:

A set-up for insulin resistance

An over-reliance on fast foods increases the likelihood of insulin resistance. The CARDIA (Coronary Artery Risk Development in Young Adults) study⁸ followed more than 3,000 young adults for over 15 years. The frequency of fast food restaurant visits was directly associated with weight gain and development of insulin resistance.

America is now often exporting its fast food—and its health problems—to other countries. East Indians who have adopted a Western

Thrifty genes make sense if famines are frequent

diet are developing obesity and diabetes. People on the islands of Okinawa, Japan, had the highest longevity rates recorded in the world. When American bases moved in, along with fast food, a dramatic increase in obesity and diabetes resulted. Their ranking in longevity has slipped vis à vis the rest of Japan.⁹

GOOD CARBOHYDRATES VS BAD

The glycemic index is a measure of the amount that a specific food causes plasma glucose levels to rise compared with that of an index food, such as glucose or white bread. Some foods that we traditionally considered to consist of complex carbohydrates, like potatoes and instant rice, actually have a higher glycemic index than table sugar.

The role that fiber and the glycemic index of foods plays in insulin resistance and weight control has been demonstrated in several studies.^{10–13} In a three-way crossover study, Warren et al¹⁰ randomized 37 children (about one third of whom were overweight) to eat breakfasts consisting of foods having either a high, medium, or low glycemic index. They found that the higher the glycemic index of the breakfast, the more calories they ate for lunch.

A review of trials of diets high in “good” carbohydrates, including fruits, vegetables, and whole grains, showed that they consistently confer a reduced risk of cardiac events.¹⁴

Some speculate that the protective effects are due to the antioxidants and vitamins in fruits and vegetables. But dietary supplements do not work as well as a diet that includes whole foods.

Several studies, including the Heart Protection study,¹⁵ the Heart Outcomes Prevention Evaluation (HOPE) trial,¹⁶ and the *Gruppo Italiano per lo Studio della Sopravvivenza nell'Infarto Miocardico* (GISSI) prevention trial,¹⁷ treated some subjects with antioxidant supplements or vitamins, resulting in no benefit against coronary disease, general vascular disease, or cancer.

■ HIGH-FAT, LOW-CARB DIET ALSO UNSUCCESSFUL

Atkins was a pioneer in promoting the idea that fat does not necessarily make people fat.

However, one problem is that he believed

that ketosis is essential to burn fat: carbohydrates have to be eliminated from the diet to the point that glycogen stores in the liver and muscles become depleted. While the body does burn fat, to maintain blood sugar, gluconeogenesis causes muscle to be used for energy as well. This causes a starvation effect and lowered metabolism, which often leads to yo-yo dieting.

Foster et al¹⁸ randomized 63 people with obesity to either an Atkins diet (low-carbohydrate, high-fat) or a conventional diet (high-carbohydrate, low-fat, low-calorie). After 6 months the Atkins dieters lost significantly more weight, but differences were no longer significant after 1 year.

Good fats vs bad fats

Another problem with the Atkins diet is that all fats were regarded as equal, and eating saturated fats was actually encouraged. We now know a lot more about different fats and their health risks.

The Nurses Health study of nearly 85,000 women over a period of more than 15 years found that those who consumed more *trans*-fat as well as a lower ratio of polyunsaturated fat to saturated fat had a higher risk of diabetes, coronary disease, and sudden death.¹¹

The Lyon trial¹⁹ randomized patients after a myocardial infarction to either a Mediterranean diet or a prudent Western diet and found that those on the Mediterranean diet had a dramatic reduction in subsequent cardiovascular events, even though differences between the two groups in blood lipid levels and weight were not significant. The Mediterranean diet included a canola oil spread, which contains alpha-linolenic acid, a type of omega-3 fatty acid. This diet is also higher in monounsaturated fats, oleic acid, and fiber than the Western diet, and is lower in linoleic acid.

The GISSI trial¹⁷ found that subjects who took omega-3 supplements had a reduced risk of coronary events and sudden death. The benefits were particularly high in patients with left ventricular dysfunction.

Omega-3 fatty acids are available through plant sources, fish oil, or supplements. Supplements available on the market appear to be reliable and without high levels of mercury.

Instant rice
has a higher
glycemic index
than sugar



The Nurses Health study²⁰ found that the more frequently people ate nuts or peanut butter, the lower the risk of type 2 diabetes. Nuts have an especially high content of good fats. Walnuts, in particular, are a good source of omega-3 fatty acids.

■ THE SOUTH BEACH DIET: GOOD FATS, GOOD CARBS

The South Beach diet was originally designed for coronary patients and was intended not only for short-term weight loss but also to help people maintain a lifelong healthy diet. It has several advantages for patients, including:

Strategic snacking. Snacking with nuts or low-fat cheese prevents the reactive hypoglycemic dip that commonly occurs in the late afternoon. Once blood sugar falls, self-control is very difficult, leading to overeating.

Simplicity, involving no counting of calories or weighing of foods.

Flexibility. No fixed ratio of nutrients is required, recognizing that people have different needs. Young athletes, for example, can safely eat a lot of protein, which is not recommended for older patients with hypertension and kidney disease.

The basic approach has three phases.

Phase 1: Eliminating carbohydrates

The first phase, lasting 14 days, involves eliminating all starches, including rice, potatoes, pasta, baked goods, fruit, sweets, and alcohol. Normal-sized portions of lean meats, eggs, reduced-fat cheese, nonfat yogurt, nuts, and vegetables are allowed. Rapid weight loss usually occurs during this period, but the most important outcome is eliminating cravings for sugar that previously resulted from reactive hypoglycemia and insulin resistance.

Phase 2: Reintroducing good carbohydrates

Carbohydrates with a favorable glycemic index, including whole grain breads and cereals, brown rice, whole wheat pasta, and whole fruits, are gradually added back into the diet. This results in a slow weight loss (1–2 pounds per week) until the weight goal is reached.

TABLE 1

Priority changes for diets

OLD PRIORITIES	TODAY'S PRIORITIES
Food by subtraction	Positive nutrition
No carbohydrates	Good carbohydrates
No fats	Good fats
Lose weight	Lose inches from the waistline
Getting thin	Being healthy

Phase 3: Lifelong healthy eating

At this point, dieters have learned which foods to choose based on their metabolic responses: brown rice instead of white rice, sweet potatoes instead of white potatoes, whole grain bread instead of white bread, whole fruits and vegetables, lean protein such as fish, and the right fats.

Weight loss and an improved lipid profile

We randomized 60 participants to the South Beach diet vs the National Cholesterol Education Program/American Heart Association step II diet (saturated fat < 7% of total calories and cholesterol < 200 mg/day) for 12 weeks. The South Beach diet resulted in greater weight loss as well as a significant decrease in the waist-to-hip ratio and serum levels of triglycerides, none of which occurred in the other diet.²¹

Weight loss on the South Beach diet does not occur at the same rate for everyone because of genetic differences in metabolic rates¹³ and other factors. I have one patient who follows the diet yet remains obese despite an excellent lipid profile. Another patient is not overweight but has a strong family history of coronary disease, and despite a low-fat diet and a lot of exercise daily, has a poor lipid profile and evidence of coronary artery disease.

We often see patients who after a time on the diet lose weight, improve their lipid profile, and have a normal hemoglobin A_{1c}, but are still not satisfied with how they look. I feel this is a cosmetic problem rather than a medical one. They can increase lean body mass through exercise, but not through starvation dieting, which causes weight to rebound.

**Snacking with
nuts prevents
reactive
hypoglycemic
dips**



■ CULTURAL CHANGES NEEDED

Eating habits are heavily ingrained in society. The South Beach diet is essentially a Mediterranean-type diet. People in Mediterranean countries do not eat the way they do because they are on a diet, but because they are surrounded by healthier foods.

We can all agree on what comprises a healthy diet, but the challenge is in applying our knowledge. We need to foster new priorities in healthy eating (TABLE 1) by educating the public and health professionals, and especially by targeting children. We also need to challenge the food industry to make restaurant dining and fast food healthier.



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ADDRESS: Arthur S. Agatston, MD, FACC, Agatston Research Institute, 4302 Alton Road, Suite 710, Miami Beach, FL 33140.