



## KETOGENIC DIETS:

An upcoming trend in  
product development?

After years of messaging about dietary fats being generally bad for health, consumers are hearing new information about fat. This is supported by growing research indicating that saturated fats may not be as bad for health as once thought,<sup>1</sup> as well as a body of research that now supports the health benefits of dietary patterns that include unsaturated fats from plant and marine sources.<sup>2</sup>

These trends have led to a growing popularity of low-carbohydrate, high-fat eating styles (popularized by the Atkins and South Beach diets) that support a ketogenic approach. But what exactly is a ketogenic diet, and is there a real niche for ketogenic products in the market?

There is no mistaking a pendulum swing in attitudes about fat and carbohydrates, including sugar. According to data from the International Food Information Council (IFIC) Foundation's 2018 Food and Health Survey, more than half of Americans who follow a specific diet or eating plan now see sugars (33%) and carbohydrates (25%) as the top two cited causes of weight gain in 2017, while only 16% cite fat as a dietary culprit in weight gain. Moreover, the study noted that 5% of overall respondents consume low carb-related diets and 3% say they follow a ketogenic diet.<sup>3</sup>

The ketogenic diet has actually been around for a long time. It was developed more than 100 years ago as a treatment for drug-resistant epilepsy, especially in children.<sup>4</sup> The premise of the ketogenic diet is to restrict carbohydrate intake (particularly easily digestible simple carbs such as sugars), while increasing consumption of high-fat foods, as well as moderate-protein foods. By replacing carbs for intake with fats and protein, the body is forced to burn fat as fuel instead of burning simple carbohydrates (the body's preferred energy source).

#### APPROXIMATE KETOGENIC DIET PARAMETERS:

- **Greater than 60%** of calories from **fat**
- **Less than 10%** of calories from **carbohydrates**
- **25%** of calories from **protein**

#### High fat for weight loss

According to researchers, the ketogenic diet is typically defined as a very-low-carbohydrate (<10% of energy), high-fat (>60% of energy) and adequate-protein diet that, without limiting calories, induces a metabolic condition called "physiological ketosis" involving increased levels of circulating ketone bodies.<sup>5</sup> Generally speaking, a ketogenic diet emphasizes consumption of fat, from high-fat dairy foods such as cheese, as well as nuts, butter, oils and avocado, with adequate high-quality protein (i.e., poultry, meats, eggs, fish), and higher-fiber vegetables that are lower in carbs (to stay at less than 50 grams of carbs per day). Although it sounds counterintuitive as a weight loss concept, the high-fat, low-carb diet puts the body into a state of ketosis, in which the body uses stored fat instead of carbohydrates for energy. The tricky part is, dieters have to consume enough fat and substantially limit carbohydrates or the body moves out of ketosis, and the diet will be less effective.

Due to its initial use as a treatment for problematic childhood epilepsy, the ketogenic diet has been fairly well researched. But today, a common allure of ketogenesis is for weight loss. There is some evidence to suggest that a ketogenic diet may help to suppress appetite and prompt faster weight loss.<sup>6</sup> Studies on the diet also suggest it may help reduce symptoms of cardiovascular disease and improve glucose and insulin metabolism... but more research is needed.<sup>7,8</sup>

Given that weight control is often an important consideration for athletes in sports that require them to compete at specific weight classes – such as boxing and wrestling – the ketogenic diet is also now seeing some interest for its potential in sports nutrition.

A 2015 study suggested that a ketogenic diet can be used by athletes as a weight-loss strategy without negatively affecting strength or power performance, although the researchers did say more study is needed in this area.<sup>9</sup>

The ketogenic diet is not easy to follow, and not without some cautions. It can create side effects such as headaches, nausea and fatigue, and because it is somewhat limited as far as the lack of variety in the foods it includes, it is likely to result in nutrient deficiencies – one of the reasons why it's not recommended by dietitians and doctors for long-term use.



## Keto-friendly ingredients

As the buzz about ketogenic diets heats up, it is prompting a potential opportunity for keto-friendly products in the marketplace – ranging from bars to shakes and spreads – to help these dieters stay in ketosis while also maintaining an otherwise healthy nutrient balance. Beyond full-fat yogurts, butter, cheese and cream (which are products packed with vitamins, minerals and keto-friendly fats), ingredients such as ghee, coconut oil (with medium-chain triglycerides, MCT) and avocado oil can be helpful to keto followers.

One of the biggest problems for these dieters is reducing carbohydrates – and hence, sugars – in their diets, ingredients that are often used in many foods and beverages. There are now a number of ingredients that could be considered keto-friendly and could be used in product formulations to reduce carbs (and sugars), while also meeting consumer expectations for taste, texture and mouthfeel.

**Stevia leaf extract**, for example, is a commonly used zero-calorie sweetener that is great for keto followers. The sweetness is extracted from the leaves of the plant species *Stevia rebaudiana*, a plant native to South America. The sweet compounds of the stevia leaf are called steviol glycosides, which are 250 times sweeter than sugar and heat stable as well. The sweetener has made significant inroads in the marketplace as a useful ingredient for beverages, snacks, and dairy products. Stevia leaf extract has not been shown to have an effect on blood glucose or insulin levels and it contains no calories.<sup>10</sup>

**Erythritol** is another sweetener that is considered keto-friendly. It is a sugar alcohol naturally present in certain fruits like grapes and pears, but produced commercially through fermentation. Research suggests that this zero-calorie sweetener has little, if any, impact on the human body metabolically, systemically or in the microbiome according to research published in the *British Journal of Nutrition*.<sup>11</sup>

Erythritol is not broken down by the body, so it cannot provide calories or affect blood sugar, and it also has excellent gastrointestinal tolerance. Erythritol is useful in products because it can act as a bulking agent for high-intensity sweeteners and can help mask the aftertaste of these ingredients.

**Inulin**, a prebiotic dietary fiber also known as chicory root fiber or Jerusalem artichoke, is another potentially keto-friendly ingredient. Inulin from chicory root fiber, in particular, is a versatile ingredient that works well in a wide range of applications, from bars and bakery items to beverages, cereals, confectionery and dairy products. It is not typically used as a sweetener, but chicory root fiber is useful as a bulking agent when reducing sugar in products in combination with high-intensity sweeteners. Because it resists digestion, chicory root fiber adds bulk to a product with half the calories of fully digestible carbohydrates, and thus it has a low impact on glycemic response and may not affect ketosis. Chicory root fiber is suitable in products that are dairy-free, low-fat and free of gluten as well as ketogenic-friendly.

Ketogenic diets may never have a mainstream following, but they are getting the attention of some diet enthusiasts. Consumers are always looking for new products that follow the trends. There are functional ingredients available that can be incorporated into foods which support the keto diet requirements and provide great taste and functionality.

#### References:

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