

## Fad diets: What is true about fad

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### Abstract

Balanced, hypocaloric diet in association to a more active lifestyle and/or bariatric surgery are the only solutions that really work against the alarming increase in overweight and obesity rates. However, overweight patients often relay on alternative, naive strategies and methods in attempt to fix their condition quickly. Fad diets are defined as weight loss strategies that promise quick results, usually promoted as not requiring physical exercise or efforts and focusing on totally unbalanced meal plans. One of the most appealing method of fad diets is the drastic reduction of carbohydrate intake, which can be acceptable but has also its “dark side”. Modifying the proportion of nutrient percentages in favor of protein intake or remarking hypothetical effects on body detoxification are typical approaches of those who promote fad diets. While some data are available on the first strategy, the scientific literature does not recognize the necessity of the body to be “detoxified” nor the existence of special meal plans/food able to do that. Trying to lose weight following a fad diet determines not only achieving a temporary result but also falling into nutritional deficiencies and other health risks. Proper, balanced nutrition and physical activity are costless, effective and sustainable in the long term and should be strongly recommended to obese and overweight.

**Key words:** weight loss; diet; fad diets; paleo diet; diet pattern; weight management; blood type diet; low carb diet

Obesity and overweight are a serious healthcare issue nowadays and their prevalence is dangerously increasing worldwide. Data provided by the Global Burden of Disease Study underlines how the prevalence of overweight increased from 26.5% in 1980 to 39.0% in 2015, which means an almost 50% increase over the past 35 years. Similarly, the prevalence of obesity rose from 7% in 1980 to 12.5% in 2015, representing an almost 80% increase (1).

Given the several pathologies and complications related to an excess of weight, a lot of strategies and methods have been developed. Balanced and personalized approach to proper nutrition and a change in lifestyle or bariatric surgery are the only solutions that really work but obese people often relay on alternative meal plans to try to fix their condition quickly.

Fad diets are defined as diets that promise quick weight loss, usually promoted as not requiring physical exercise or efforts. In table 1, we summarize fad diets' main characteristics.

**Table 1.** Main characteristics of fad diets

<b>FAD DIETS</b>
<ul style="list-style-type: none"> <li>• Restriction of one or more food categories</li> <li>• Unusual food choices,</li> <li>• Claim on “miraculous” foods</li> <li>• May be based on pseudoscience</li> <li>• Mass media/celebrities endorsement</li> <li>• Quick results</li> <li>• Don't require physical exercise</li> </ul>

**Table 2.** Fad diets' categories

FAD DIETS
<ul style="list-style-type: none"> <li>• <b>Food-specific diets</b>, which focus on eating a single food (i.e. cabbage soup diet or grapefruit diet)</li> <li>• <b>Low-carb diets</b>, such as the Atkins diet</li> <li>• <b>Low-calorie diets</b>, like the Ornish diet</li> <li>• <b>Very low calorie diets (VLCD)</b> often involving meal replacement drinks</li> </ul>

Describing the most famous fad diets lies beyond the scope of the present article, but the following table (Tab.2) refers to the main groups which fad diets generally fall into:

Fad diets can be tempting since they offer a quick fix to long-term problem but reality is not as easy as it seems. In fact, losing a great amount of weight in a relatively small time slice is related to a loss of fat free mass, a decrease in basal metabolic rate (2) and it can lead to depression, quick weight regain or eating disorders (3).

The purpose of this article is to disclose the real dangers and lies behind the most famous fad diets and uphold that a magic weight loss method does not exist.

One of the most common approach to weight loss is the reduction of carbohydrate intake, from the recommended intake 45-65% of daily energy intake (4) to ~20% or less.

This widespreading "carbophobia" comes from the so-called Carbohydrate-Insulin Model (CIM) of obesity (5), which tries to explain the weight gain through the hormonal response –especially insulin - to the dietary nutrients. According to the CIM, since carbohydrates has the greatest effects on insulin production and insulin exerts the promotion of fat synthesis and deposition, high-glycemic carbohydrates are the main culprits of weight gain.

Success of low carbohydrate diet is well documented. Ebbeling et al (6) recently published the results of a 20 weeks intervention on 164 adults, randomly assigned to diets that differed in carbohydrate content (high, 60%; moderate, 40%; low, 20%). After 20 weeks, total energy expenditure was significantly greater in participants assigned to a low carbohydrate diet compared with high carbohydrate diet of similar

protein content. Authors concluded that the difference in total energy expenditure could be due only marginally to resting energy expenditure or physical activity level and more probably to the other factors, such as: thermic effect of food, activity of brown adipose tissue, autonomic tone, nutrient cycling, fidgeting and related non-exercise activity thermogenesis, differences in hormonal responses to diet. The authors highlighted the importance of their novel findings about the lower levels of Ghrelin of those participants assigned to the low carbohydrate diet.

Additionally, the DIOGenes (Diet, Obesity and Genes) Study shows that also protein content matters. Changes in diet composition with respect to protein to carbohydrates ratio and the Glycemic Index have a positive role in weight loss and weight control both in adults and children (7). Further research are however needed since researchers found that the superiority of high protein, low glycemic index is real only for those with a particular genetic makeup (2/3 of population), but irrelevant in the others.

Taking a closer look to high protein diets, we should mention the Paleolithic diet or Paleo Diet. Paleo diet is a nutritional approach stressing the advantages of eating unprocessed, nutritious foods, mainly those available in Paleolithic times. Paleo diet typically includes all staples that in the past were obtained by hunting and gathering (lean meats, fish, nuts and seeds) and limits foods that became common after Neolithic Age and the introduction of farming: dairy, legumes, grains (8).

The popularity of the Paleo diet arose during these past years becoming a potential answer to obesity, autoimmune diseases, Irritable Bowel Syndrome (IBS) and other digestive problems. Many scientific articles were published to prove the efficacy of this dietary pattern on overall health. But, as underlined by many authors, these data need to be confirmed by wide randomized controlled trials (RCTs)(9).

A prospective biracial study published in 2017 underlined for the first time that Paleo-like dietary pattern could lower the risk of all-cause, cardiovascular-specific, cancer-specific, and other non-injury or accident-specific mortality (10).

Nonetheless the protective association was slightly stronger for the Mediterranean diet, to underline how

a more well-balanced meal plan is healthier, more sustainable over the long-term and has a stronger protective potential.

Recently, the attention of the scientific community has focused on how diet and dietary compounds affect our microbiota, since its pivotal role for host health.

It is well established that Western diets, rich in saturated fats, high glycemic-index, low fiber foods, are responsible for significant changes in microbiota and in microbial diversity, determining a more pro-inflammatory profile (11) and a shift toward dysbiosis. This shift results in an overgrowth of pro-inflammatory Proteobacteria such as *E. coli*, a decrease in protective bacteria, and a significantly reduction of Short Chain Fatty Acids, that are known to be beneficial for the intestinal trophism (12).

Differently, a Paleolithic diet has a correlation to a higher microbial richness and biodiversity in comparison to Mediterranean pattern, which means a higher proportion of Firmicutes (72%), Bacteroidetes (17%), Proteobacteria (6%), and Spirochaetes (3%) (13).

However, further studies are needed to clarify how Paleo diet modify gut microbiota and the implications on health outcomes. Moreover, a modified pattern of the Paleo diet has been recently investigated for its potential positive impact on several symptoms of Multiple Sclerosis (MS): fatigue, disability, gait speed, mood and cognitive function improved in a group of with progressive MS (14). This is only one of several studies on dietary intervention on MS patients, which shows encouraging results.

Although weight loss is easier to achieve through high protein, low carb diets, we cannot mention their potential “dark side”. A newly published work of Seidelmann et al, analyzed data from 15428 US adults enrolled in the Atherosclerosis Risk in Communities (ARIC) study (15). Authors investigated, among several variables, the association of carbohydrate intake and all cause mortality.

After statistical adjustments, no significant differences were found in hypertension rates nor in 3-year and 6-year weight gain across carbohydrates quintiles. But dietary patterns marked by both low carbohydrate (< 40% of energy from carbohydrate) and high

carbohydrate (> 65-70% of total energy) consumption were associated with increased mortality risk, with a protective effect of moderate carbohydrate consumption (50-55% of energy). Authors concluded that there may be a U-shaped association between mortality and carbohydrate intake as confirmed by other studies performed on Asian, European and multinational samples.

Taking a deeper look in the fad diets phenomenon in recent years, blood type diet and other hypothetical detox diets should be mentioned.

Blood type diet, advocated by naturopath Peter D’Adamo, is based on the belief that everyone should eat the right foods according the one’s blood type. Since blood type is the results of a different evolutionary heritage, group O (considered the ancestral blood group), that one of the hunter-gatherer, can benefit from the high animal protein diets. Those people with group A should follow a vegetarian diet as this blood group was firstly developed into agrarian societies. Individuals with blood group B are considered to benefit from consumption of dairy products while individuals with an AB blood group are believed to benefit from a diet that is intermediate to those proposed for group A and group B (16).

It’s easy to understand how these dietary pattern have not been supported by any scientific data. On the other hand, Wang et al have repeatedly shown how potential benefits of following the blood type diets are not due to blood type itself but to healthier food choices. In detail (17), analyzing the correlation between blood type and cardio-metabolic risk on 1455 subjects, Wang revealed that adherence to the Type-A diet was associated with better outcomes (BMI, waist circumference, blood pressure, serum cholesterol, triglycerides, insulin, HOMA-IR) compared to other blood types. But this association is not surprising if we consider that this diet suggests high consumption of fruits and vegetables, and low consumption of meat products, which are characteristics that many health agencies recommend as preventive factors for cardiovascular disease. After four years, the same authors questioned the truthfulness of Adamo’s dietary model, taking in exams a group of 973 subjects from the Toronto Healthy Diet Study. No significant

interactions were observed between diet, blood group and any risk factors either at baseline or after a 6-month dietary intervention, revealing that the association between blood-type diet adherence and cardio-metabolic risk factors is not affected by blood group (18).

One of the fake promises of fad diets is that of detoxify body. On this regard, in 2014 the British Dietetic Association published a review analyzing the scientific veracity of detox diets' capability to produce weight loss and/or toxins elimination. The first and decisive objections to the (few) studies supporting these ideas are basically two: the lack of rigorous clinical investigation and the several methodological limitations. The latter can be summarized as follow: small samples, sampling bias, lack of control groups, reliance of self-report, qualitative measurements. Not to be forgotten, human body is perfectly able to eliminate unwanted substances on its own (19).

Heavy metals (cadmium, mercury, arsenic, aluminium) instead are not easily removed with the tendency to accumulate in body tissues (mainly fat tissue and bones) so some preliminary data on some natural compounds seems promising.

Allium sativum (garlic), Silybum marianum (milk thistle), Coriandrum sativum (cilantro), Ginkgo biloba (gingko), Curcuma longa (turmeric), Chlorophyta (green algae) seem to have natural chelating properties (20). The paucity of data and doubtful methodologies cast uncertainty over the validity of the result. The association between detox diets and weight seems loss weaker (19).

We should not forget the risks of fad diets, with special concerns on nutritional deficiencies. In a recent study (21), authors focused on the nutritional adequacy of seven single-day menus of 3 commercial diet plans (the Eat to live-Vegan Aggressive Weight Loss; the Fast metabolism Diet; the Eat, Drink and Be Healthy).

Compared to Dietary Reference Intake (DRI) values for U.S male adults (22), these diets failed in providing at least 2–6 essential micronutrients of the 20 assessed micronutrients. The most deficient micronutrients were vitamin D, calcium or B12. This study is a confirmation of previous work on questionable dietary quality of some diets. Atkins, South Beach, DASH, Best life menus were analyzed for 27 micronutrients

supply and reported to be deficient in six micronutrients: biotin, vitamin D, vitamin E, Chromium, Iodine, Molybdenum. The authors tried to optimize the four diet plans, calculating the caloric content in order to supply the 100% RDIs for 21 and 27 essential micronutrients. In order to do this, the required daily calories were calculated to be between 2425 and 5000 kcal, which are conflicting with the aim of losing weight (23).

We want to end this review mentioning the recent article published on Metabolism Journal Clinical and Experimental, which takes in exam the information and the research about weight loss strategies (24). As to confirm what stated so far about their fallacy, no fad diet and no unconventional weight loss strategy are mentioned. Considering the weight loss strategies above mentioned, the review summarized that Very Low Carbohydrate Diet is more efficient in determining a greater weight loss in comparison to a moderate low calorie diet or low fat diet. A more moderate reduction in carbohydrate content (low carb diet) results in equal weight loss compared to isocaloric, higher carbohydrate diet. With special regard to high protein content, there are no conclusive data on the greater weight loss derived from high protein diet.

The Mediterranean dietary pattern, in the context of a hypocaloric diet, succeeded in weight reduction and results in other health-enhancing benefits such as a better cardiovascular and glycemic profile (25). The most recent scientific publication confirm these results. A meta-analysis appeared on Journal of evidence-based medicine (26) took in exam ten RCTs of dietary interventions in a sample of people with type 2 diabetes. Compared to low fat diet, the Mediterranean diet brought to a better improvement in glycemic control (HbA1c and fasting plasma glucose), in metabolic parameters (weight loss, waist circumference) and to improved cardiovascular risk factors (total cholesterol; HDL-cholesterol; triglycerides).

Another supportive data come from the PREDIMED trial (27). After one year, the intervention combining an energy-restricted Mediterranean diet, physical activity and behavioral support resulted in an average weight loss of 3.2 kg vs 0.7 kg of the control group.



Cardiovascular risk factors, including visceral adiposity, fasting glucose, triglycerides, and HDL cholesterol, significantly improved in the intervention group. There was a trend toward statistical significance even in a reduction in insulin resistance, HbA<sub>1c</sub>, leptin, interleukin-18, and other pro-inflammatory markers.

## Conclusion

As obesity rates are constantly increasing, several weight loss strategy are promoted. Some of them are supported by scientific research, others are totally unconventional and unfounded. Fad diets are dietary strategies which promise immediate, quick results, hal-lowing a particular food (i.e the cabbage soup diet, the grapefruit diet...) or demonizing food or food groups (especially fat and carbohydrate). No fad diets really focus on lifestyle change, not encouraging the increase of physical activity and not promoting long-term, healthy food choices.

This kind of diet are appealing since they take advantage of people' illusions and hypes, often exploit-ing wrong cultural models.

However, nobody promoting fad diets talks about their "dark side". Firstly, their meal plans are unlikely bearable in the long term since they promote a dra-matic caloric reduction, due to avoidance of fat and/or carbohydrates. As the BDA stated in its position paper (19), dieting has not only a low estimated suc-cess rate (about 20%) but has also a stressful potential, increasing cortisol with consequent increase of appe-tite, of the risk of binge eating or physical side effects of deprivation (nausea, headache, fatigue...).

Who advertises fad diets does not point out the impermanence of the results, which are easily lost as soon as dieters stop sticking to their dietary plan. Lack of promotion of healthy food choices and a more active lifestyle are the main culprits of this volatile weight loss. In addition, drastic restriction of food intake – if not acted wisely – exposes to nutritional deficiencies, which is not uncommon to find even if overweight and obese population.

There is no magic bullet able to solve a timeless problem such as obesity at once. Overweight and obese people has to be addressed to a balanced, personalized

diet and to healthier food choices, as well as to a more active lifestyle. Diet is not a matter of a few months, it's a lifetime path and a long-term investment on personal health. Results last only if dietetic meal plans are not an imposition but indeed a way to educate to a right diet to maintain even when the weight goal has been reached.

A supportive multidisciplinary team with a physician with a degree in Nutrition, dietitian, psychologist (when needed) is the only who has the skills to follow patients with a relevant overweight, can deal with all the related health issues and can reinforce resolution and motivation throughout the weight loss journey.

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