

## Some Beliefs About Weight Loss

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Received: May 21, 2022; Published: May 31, 2022

### Abstract

**Objectives:** to analyze some popular beliefs concerning the individual measures to prevent obesity and to promote weight loss and to compare them with the recent relevant scientific publications.

**Study design and Methods:** The related experimental papers and reviews were searched for in MedLine/PubMed, Web of Science, and SCOPUS databases from 2000 to 2021. In cases of repeated or conflicting information or references, more recent sources have been preferred. Words used to search were “obesity” or “weight loss”, “healthy lifestyle”, “nutrition” or their combinations.

**Results:** Benefits of no fat consumption, skipping the breakfast, reduction the number of meals, fasting, healthy lifestyle, physical activity and smoking are critically evaluated. These beliefs are only partially supported or not supported by the existing scientific knowledge at all.

**Conclusions:** Measures for weight loss should be based less on common beliefs and more on scientific data. This conclusion stresses the importance of public education and wide propagation of healthy life style by specialists.

**Key words:** Obesity; Food; Lifestyle; Weight loss

### Introduction

It is paradoxical that achieving the human dream – elimination of poverty and hard manual labour, along with acquiring sufficient leisure time – endangers the health, quality of life, and longevity of people. World’s leading cause of death are diseases related to metabolic dysfunctions. The most significant in this aspect is overweight, which affects 1.9 billion of people around the world, of whom 650 million are obese [1]. In the last 40 years, the number of obese people in the world has tripled and thus we can speak of obesity pandemic [2]. Obesity and overweight can facilitate diabetes, cause inflammations, cardiovascular and reproductive diseases as well as cancer [3,4]. In addition to these health risks, they are a cause of mobility issues, as well as problems in social and sexual

relationships. They lower self-esteem and the overall quality of life. They also lead to considerable economic losses. Health care concerning patients with obesity incurs at least 25% higher expenditures and causes losses of 1–3.6% of the gross domestic product of a country [5].

Obesity is a pathological hypertrophy (an unhealthy growth) of adipose tissue, which leads to many metabolic diseases. Obesity is caused by long-term imbalance between the intake and expenditure of energy, when excess energy is accumulated in the form of fat stores. Excessive fat stores weigh down the organism and produce substances that cause many diseases, which are described in the corresponding reviews [1,2,5,6].

**Citation:** Alexander V. Sirotkin. (2022). Some Beliefs About Weight Loss. *Archives of Nutrition and Public Health* 4(1). DOI: 10.5281/zenodo.6609563

This publication aspires to be a scientific review, which contains a critical overview of validated and non-validated knowledge concerning some measures to prevent obesity. At the same time, it wants to be comprehensible, interesting and useful even for a reader without a deep scientific background.

**Study design:** The objective of this publication is to review of the most recent scientific publications concerning measures to prevent and mitigate obesity and to promote weight loss.

Search for literature was performed in agreement with the PRISMA-ScR criteria (PRISMA-ScR-Fillable-Checklist\_11Sept2019.pdf (prisma-statement.org)) Related articles were searched for in MedLine/PubMed, Web of Science, and SCOPUS databases from 2000 to 2021. In cases of repeated or conflicting information or references, more recent sources have been preferred. Words used to search were “obesity” or “weight loss”, “healthy lifestyle”, “nutrition” or their combinations. Both relevant experimental papers and the reviews were evaluated. A total of 301 research papers and reviews were inspected, and 126 were considered as useful and suitable for analysis.

### **Some beliefs about weight loss**

Among people, on the internet, and in literature, even the scientific, circulate many weight loss recipes. Some of them, however, should be taken with a grain of salt. Here are a few wide-spread beliefs about weight loss, which are not supported by the existing scientific knowledge.

#### ***If we don't eat fat, we'll be healthy and slim***

Healthy – that will not happen without fats. As was already mentioned, body needs fat to store energy, for thermoregulation, mechanic protection for internal organs, as a building material for cells, as a source of hormones, a solvent for some substances, source of water, and likely also as a source of other cell types [7].

Slim – that is also questionable. Obesity can be facilitated not only by the consumption of fats, but proteins and carbohydrates as well. Lipids can be produced in metabolism of proteins [8] and carbohydrates [9,10]. And if we consume large amounts of proteins and carbohydrates, these are burned instead of fat, which is then all stored instead of burned. Additionally, carbohydrates trigger production of insulin, which activates storing of fat (Bray, 2013). Therefore, fat stores can grow not only from fat intake, but from carbohydrates

and proteins as well. For example, high protein intake from protein diets and during bodybuilding can lead to obesity instead of weight loss [12,13].

#### ***If I skip breakfast, I'll lose weight and be healthier***

In some experiments, skipping breakfast aided in treatment of obesity [14], but other studies did not confirm this effect [15]. One reason can be that skipping breakfast disturbed the circadian rhythms of the metabolic process and reduced not only the intake but the expenditure of energy (as discussed earlier) as well. Some authors even state that skipping breakfast was linked to higher obesity rate, worse quality of nutrition [16,17] and increased levels of fat and risk of cardiovascular diseases [15,17].

#### ***The more often I eat, the more weight I gain***

What matters more is how much and what you eat. Number of daily meals evolves along with lifestyle [15]. Our ancestors – apes and hunters of the Stone Age – likely did not strictly divide meals into breakfast, lunch and dinner, but ate when food was available. The Ancient Romans ate usually only one meal at midday, and the medieval people – breakfast and lunch. It was only with the introduction of artificial lighting, which prolonged daily activities, that an evening meal became the social norm. Comparative studies of the prevalence of obesity showed better weight loss results for people eating 1-2 times a day and 5-6 times a day than those who ate 3 times a day [15]. Therefore, we can choose from two alternative models of eating. The first alternative is only one or two meals a day. This model can be better suited to busy people. The second model recommends 5 to 6 meals a day. Here, however, it is necessary to control the portion sizes of the individual meals in order to not exceed the optimum daily intake. Considering the physiology of digestion as well as the circadian rhythms, I lean towards the second model and recommend dividing the optimum daily energy intake into breakfast, lunch, dinner and a morning and afternoon snack.

#### ***Fasting helps with weight loss***

Not always. In fact, you can even gain weight during a fast [15]. The body resists the loss of energy stores by reducing energy expenditure (for heat production, physical activity, etc.) and increasing storing of fat after the fast. A religious fast (such as Lent or Ramadan) does not always mean a decrease in the calorie intake, but only a change in the type of food consumed (meat replaced by fish, pasta, etc.) or a change from eating during the day to eating at night

(which is not healthy). Despite that, it is widely practiced due to spiritual, cultural and religious reasons. In the past, there were also economic reasons (fasting in spring, when there was little food). Roman emperors used to avoid food one day a month for health [18]. Fasting can truly lead to reduction in weight, but only in combination with low-calorie diet [19]. In some studies, fasting led to weight loss in all patients [20], in some, only in the obese ones but not the healthy ones. At the same time, the body weight returned to its original values at a rapid rate after fasting [21].

#### ***With healthy lifestyle, anyone can manage healthy weight loss or gain***

In theory, if I take in less energy and increase my expenditure of it, I will be losing weight. And the other way around. Therefore, the obesity epidemic is often connected to sedentary lifestyle. Long hours spent in front of television correlate with risk of obesity in both children and adults [5]. For these reasons, limiting food intake and increasing physical activity are the most popular weight loss methods. In most cases it is even correct, but not always. First, hereditary obesity or thinness exist and they are not caused by incorrect eating habits but by damaged genes (polymorphism, mutations) regulating metabolism [22,23]. Second, a condition for weight loss is the combination of decreased energy intake and increased expenditure of it. To disrupt the equilibrium between these processes is very difficult not just psychologically but also physiologically. We have already described various interconnected feedback mechanisms, which guard the equilibrium between the intake and expenditure of energy and stabilize the energy stores of the organism. For example, the body reacts to decreased calorie intake by decreasing expenditure of energy and thus preserves the fat stores in an unchanged state [15]. Third, sport and exercise can increase energy expenditure to produce motion and heat. This expenditure, however, represents only a small percentage of the total energy output. The largest portion of energy expenditure is for basal metabolism (breathing, digestion, and thermoregulation). Basal metabolism is unique for each individual, hereditary, and difficult to influence [22]. For example, the dissipation of heat is different between men and women [24].

#### ***Physical activity burns fat***

Not always. Regular physical activity (sport, manual labour) activates at once the burning of fat, glycogen, and proteins. However, when a couch potato decides to start exercising, his body will first burn glycogen, then proteins and finally fat. Therefore, he'll need

more time and effort to burn fat than a person who is regularly physically active. If he burns any fat at all [7].

#### ***Smoking is slimming***

This myth is based on the fact that people who stop smoking often gain weight. That is, however, a result of an overall improvement in health and that these people exchange one vice for another (instead of a cigarette, they reach for candy). In reality, smokers (regardless of the number of cigarettes smoked daily) gain approximately 4.4 (men) and 5.0 (women) kg more over 10 years than non-smokers [5].

Therefore, the common beliefs listed above are only partially supported or not supported by the existing scientific knowledge at all. Therefore, the individual measures for weight loss should be based less on common beliefs and more to scientific data. This conclusion stresses the importance the public education and wide propagation of healthy life style by specialists.

I hope the present information will spare the false hope and unnecessary disappointment of the readers, when engaging in activities that might not bring desired results. On the other hand, I believe this knowledge can help to define and manage a healthy lifestyle. And individual obesity treatment should be consulted with experts – medical doctors.

#### **Conflict of interest statement**

The author declares no conflict of interest.

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