

The History of Calorie Counting

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The history of dieting by calorie counting shows why it should stay in the past, experts say

Calorie counting has been the basis of weight-loss programs for more than a century.

It's still a popular way to approach losing weight, whether it be keeping below a certain calorie limit on fasting days or using an app to calculate "calories in" versus "calories out".

But many leading experts are now calling for that to change.

They say calorie counting is based on flawed, obsolete science.

And they say our obsession with the calorie has actually served to make us fatter.

Calorie confusion

The history of the calorie is "complicated," says University of South Carolina historian Allison Marsh.

"The term calorie emerges on different continents at different times with different meanings," she tells ABC RN's Rear Vision.

The calorie began its life as a unit of stored heat.

French physicist Nicolas Clément used the term in the 1820s while giving lectures on the efficiency of steam engines.

He defined the calorie as the heat needed to raise the temperature of a kilogram of water by one degree Celsius.

This was not the only definition, however, with others defining a calorie as the heat needed to warm a single gram of water by one degree Celsius — a unit 1,000th of the size of Clément's.

In 1879, French chemist and politician Marcellin Berthelot distinguished the two units by designating the smaller one as a calorie, with a lower-case c, and the larger as a capitalised Calorie.

"Of course," Marsh says, "this leads to a tremendous amount of confusion."

Adding to this confusion, the calorie isn't the standard unit energy in the International System of Units — that's the joule (a kilojoule is 1,000 joules).

Potential energy

Part of the reason for the calorie's continued use, especially in the USA, was thanks to an 1887 article by chemist Wilbur Atwater, entitled The Potential Energy of Food, published in the popular monthly Century magazine.

Wilbur Atwater ran a series of experiments to determine how the body absorbed calories from food. (Wikimedia Commons: Public Domain)

Rather than trying to measure the energy of steam engine fuel, Atwater was attempting to measure the human body's metabolic rate.

"He was really interested in how the body was processing energy," Dr Marsh says.

He set about measuring the potential energy of different types of food.

But, unlike some previous efforts to do this, he didn't just measure the food once.

Atwater considered how much of the food we eat is actually absorbed into the body. He understood what University of Cambridge obesity researcher Giles Yeo calls the "sweetcorn scenario".

"You eat corn on a cob, and then the next day you look in the loo, and you clearly haven't absorbed all the sweet corn," Dr Yeo says.

So Atwater measured the calories of many different foods. Then he fed those foods to human subjects, waited for them to digest the food and measured their excrement

He subtracted the calories in the poo from the calories in the food in order to come up with a total number of calories absorbed.

He used these calculations to come up with a system for determining the calorie content of foods, for example nine calories per gram of fat and four calories for every gram of carbohydrates or protein.

"These numbers, these Atwater factors as they're still called, are the basis of all the calorie counts we see on every single food packet across the world today," Dr Yeo says.

Calorie counting

Obesity was not a pressing public health issue in the 19th century, with experts more interested in combating malnutrition.

But in the 20th century, weight loss became a priority – especially for women chasing the "ideal" body shapes presented in magazines and on the silver screen.



Lulu Hunt Peters popularised calorie counting in the US. (Wikimedia Commons: Public Domain.)

In 1918, Dr Lulu Hunt Peters published her best-selling diet book *Diet and Health: With Key to the Calories*.

The book was based on her syndicated newspaper column in which she documented her process for losing weight.

She calculated the calorie content of various foods in her diet and counted how many calories she was consuming.

"She began trying to cut her calories to lose weight and it succeeded," Dr Yeo says.

Dr Yeo says Peters' book "weaponised" the calorie.

"She was the mother of calorie counting and calories in weight loss."

The halo effect

In the years after World War II, US public health authorities became increasingly concerned by the rising rate of heart disease, which was associated with weight gain.

In an attempt to slim down the population, the concept of the calorie became popular. "It was something people thought they could control", says London-based freelance journalist Peter Wilson, who wrote *Death of the Calorie* in *The Economist's* 1843 magazine.

Fat became the focus of government policy because a gram of fat contained more calories than a gram of carbohydrates or protein, he says.

When scientists compared an ultra-processed diet to an unprocessed one - matched calorie for calorie - the processed food still caused people to gain weight. Why?

Politics came into play too.

"The sugar lobby out-witted, out-lobbied and out-paid the fat lobby, and [they] managed to get the finger of blame pointed at fat for causing obesity, diabetes and rising incidence of heart attacks," he says.

"So in the 1970s and early 1980s, the American government basically said fat is the enemy."

The food industry loved this, Wilson says, because they could manufacture highly processed foods that claimed to be healthy because they were low in fat.

The products were profitable, Wilson says, and had long shelf lives, because the fat was replaced by sugar, starch and salt.

An example of such a product, University of Sydney historian Chin Jou says, was *SnackWell's*, a heavily advertised brand of low-fat cookies.

"The idea was that Americans could have it both ways — that they could enjoy delicious foods and those foods could be low in fat," Dr Jou says.

The cookies tasted great, she says, because they were "loaded with sugar". However, because they were low in fat, they had fewer calories than other cookies.

Worse, these foods encouraged over-eating.

"The problem was these products had what, academically, is referred to as the 'halo effect'," she says.

"These foods are seen as okay to eat — the opposite of sinful — and because of that, people might over-indulge."

Rather than having one or two cookies, Dr Jou says, people would eat the entire packet and still be hungry.

"Such foods would be high glycaemic index (GI) foods, in which people's blood sugar would spike and then they would be hungry soon after."

Calories don't add up

It's not just our diet that's contributed to increased obesity rates.

People these days do less physical work because our jobs are increasingly sedentary and our homes are filled with labour-saving devices.

"It's a mix between the environment, the food environment and, really, our lifestyle," Dr Yeo says.

Diet still plays an important role, but Dr Yeo says the problem with focusing on calories is that not all calories are equal.

While our body has to work for the calories in unprocessed foods, he says, fast foods and convenience foods are "far more calorically available".

"Even if we ate exactly the same 400 calories, we would absorb far more calories than if we ... ate a steak or ate sweetcorn," he says.

This is one reason, he says, why you cannot decide which food is healthier purely by comparing their calorie count.

"We are now equating calories with health when that's not what the calorie was designed to do," he says.

Another reason, he says, is that Atwater's system usually produces calorie counts that are wrong.

The system only gives the calorie content of protein, carbohydrates and fat, he says.

"But we don't eat protein, carbohydrates and fat individually, right? We eat food."

The system is also unreliable, he says, with calorie counts for meals being out by around 10 per cent, on average.

"The problem is 10 per cent adds up pretty quickly. Ten per cent is 200 calories of a 2,000 calorie meal, 10 per cent of 20,000 calories is 2,000 calories."

While Atwater's system is attractive in its simplicity, Yeo says, that doesn't change the fact that it's inaccurate.

"It may be difficult, but I do think we should be able to do better because this is incorrect," he says.

"I hate things that are wrong. We should try and fix it, because they are wrong."