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NewScientist

WEEKLY 18 July 2009



These burgers are identical...



...but one will make you fatter

**Not all calories are
created equal**

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fiction

Nutrition Facts

Amount per Serving

Calories 150 Calories from Fat 70

% Daily Value*

Total Fat 7g 11%

Saturated Fat 1.5g 6%

Cholesterol 0mg 0%

Sodium 120mg 5%

Total Carbohydrate 20g 7%

Dietary Fiber 4g 15%

Sugars 9g

Protein 1g

* Percent Daily Values are based on a 2,000 calorie diet. Your daily values may be higher or lower depending on your calorie needs:

Calories 2,000 2,500

Calories per gram:

Fat 9 Carbohydrate 4 Protein 4

The calorie delusion

Your food doesn't do exactly what it says on the label, Bijal Trivedi discovers

STANDING in line at the coffee shop you feel a little peckish. So what will you choose to keep you going until lunchtime? Will it be that scrumptious-looking chocolate brownie or perhaps a small, nut-based muesli bar. You check the labels: the brownie contains around 250 kilocalories (kcal), while the muesli bar contains more than 300. Surprised at the higher calorie count of what looks like the healthy option, you go for the brownie.

This is the kind of decision that people watching their weight – or even just keeping a casual eye on it – make every day. As long as we keep our calorie intake at around the recommended daily values of 2000 for women and 2500 for men, and get a good mix of nutrients, surely we can eat whatever we like?

This is broadly true; after all, maintaining a healthy weight is largely a matter of balancing calories in and calories out. Yet according to a small band of researchers, using the information on food labels to estimate calorie intake could be a very bad idea. They argue that calorie estimates on food labels are based on flawed and outdated science, and provide misleading information on how much energy your body will actually get from a food. Some food labels may over or underestimate this figure by as much as 25 per cent, enough to foil any diet, and over time even lead to obesity. As the western world's waistlines expand at an alarming rate, they argue, it is time consumers were told the true value of their food.

Calorie counts on food labels around the world are based on a system developed in the late 19th century by American chemist Wilbur Olin Atwater. Atwater calculated the energy content of various foods by burning small samples in controlled conditions and measuring the amount of energy released

in the form of heat. To estimate the proportion of this raw energy that was used by the body, Atwater calculated the amount of energy lost as undigested food in faeces, and as chemical energy in the form of urea, ammonia and organic acids found in urine, and then he subtracted these figures from the total. Using this method, Atwater estimated that carbohydrates and protein provide an average of 4 kcal per gram, while fat provides 9 kcal per gram. With a few modifications, these measurements of what is known as metabolisable energy have been the currency of food ever since.

We know these values are approximate. Nutritionists are well aware that our bodies don't incinerate food, they digest it. And digestion – from chewing food to moving it through the gut and chemically breaking it down along the way – takes a different amount of energy for different foods. According to Geoffrey Livesey, an independent nutritionist based in Norfolk, UK, this can lower the number of calories your body extracts from a meal by anywhere between 5 and 25 per cent depending on the food eaten. "These energy costs are quite significant," he says, yet are not reflected on any food label.

Dietary fibre is one example. As well as being more resistant to mechanical and chemical digestion than other forms of carbohydrate, dietary fibre provides energy for gut microbes, and they take their cut before we get our share. Livesey has calculated that all these factors reduce the energy derived from dietary fibre by 25 per cent – down from the current estimate of 2 kcal per gram to 1.5 kcal per gram (*The American Journal of Clinical Nutrition*, vol 51, p 617).

Similarly, the number of calories >