

Briefing 14:03

THE FAT LIE

By Christopher Snowden
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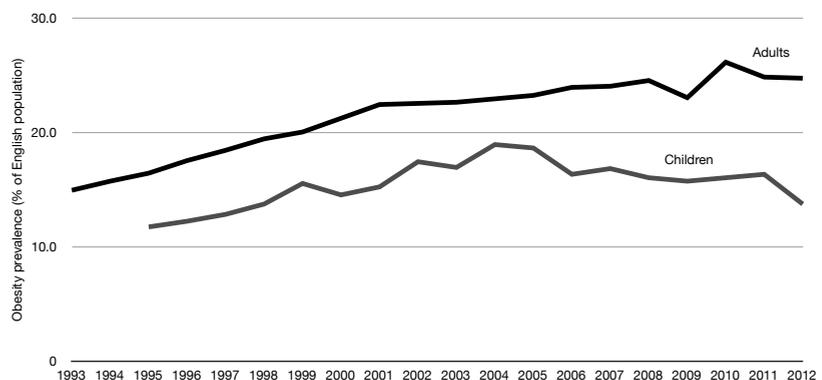
Summary

- The rise in obesity in recent decades is popularly believed to be the result of increased consumption of calories in general and sugar in particular.
- Campaigners have called for product reformulation, fat taxes and other anti-market policies to reduce calorie consumption at the population level.
- All the evidence indicates that per capita consumption of sugar, salt, fat and calories has been falling in Britain for decades. Per capita sugar consumption has fallen by 16 per cent since 1992 and per capita calorie consumption has fallen by 21 per cent since 1974.
- Since 2002, the average body weight of English adults has increased by two kilograms. This has coincided with a decline in calorie consumption of 4.1 per cent and a decline in sugar consumption of 7.4 per cent.
- The rise in obesity has been primarily caused by a decline in physical activity at home and in the workplace, not an increase in sugar, fat or calorie consumption.

Obesity trends

Obesity prevalence increased sharply in Britain in the 1980s and 1990s. In the current century, the rate of increase has slowed down for adults and gone into reverse for children, but Britain remains the fattest country in Europe. Figure 1 below shows obesity prevalence for children and adults in England since 1993 (Health and Social Care Information Centre, 2013).

Figure 1: Obesity trends in England



Obesity is caused when individuals repeatedly consume more calories than they burn off. Many public health campaigners portray Britain's obesity 'epidemic' as being caused by the increased availability of high calorie foods, sugary drinks and larger servings in restaurants. This view has been reflected in television programmes such as *The Men Who Made Us Fat* (BBC), which focus on the

supposed rise in calorie consumption while paying little attention to the other side of the equation: physical activity. Some campaigners explicitly dismiss physical activity as a factor. For example, Aseem Malhotra, science director of Action on Sugar, says that 'it's time to bust the myth of physical activity and obesity'.

This short paper will demonstrate that this conventional wisdom has no basis in fact. If people are 'being bombarded every day by the food industry to consume more and more food', as some claim, then the industry has failed (Peretti, 2012). Consumption of calories - and of sugar and fat - has fallen significantly while obesity rates have risen.

The DEFRA survey

According to the British Heart Foundation (2012 :107):

‘Overall intake of calories, fat and saturated fat has decreased since the 1970s. This trend is accompanied by a decrease in sugar and salt intake, and an increase in fibre and fruit and vegetable intake.’

This statement may come as a surprise to some people, but it is factually correct. All the available data support it. The Department for Environment, Food and Rural Affairs (DEFRA) has carried out annual surveys of the British diet since 1974. These surveys are based on diet diaries compiled by a cross-section of the public and are supported by till receipts (DEFRA, 2013).

Shown in Figure 2, these data indicate a significant decline in daily per capita calorie consumption in the last forty years, from 2,534 in 1974 to 1,990 in 2012. This represents a decline in energy consumption of 21.5 per cent.

The DEFRA survey also contains data on per capita consumption of different sources of calories. Figure 3 shows a decline in the consumption of ‘total sugars’ of sixteen per cent since 1992¹ and Figure 4 shows a decline in saturated fat consumption of 41 per cent since 1974. Consumption of protein, cholesterol, sodium and carbohydrates (of which sugar is one) have all declined since 1974. Indeed, the consumption of almost all of the nutrients in the British

1 Data for sugar was not collected separately until 1992.

diet have either declined or held steady since the DEFRA study was initiated. The only notable exceptions are Vitamin C - which rose from 54 mg per day in 1974 to 75 mg per day in 2012 - and a small rise in the consumption of poly-unsaturated fats which has been more than offset by a larger decline in consumption of saturated fats and mono-unsaturated fats. Overall, fat consumption declined from 111 grammes per day in 1974 to 81 grammes per day in 2012.

Figure 2: Per capita calorie consumption

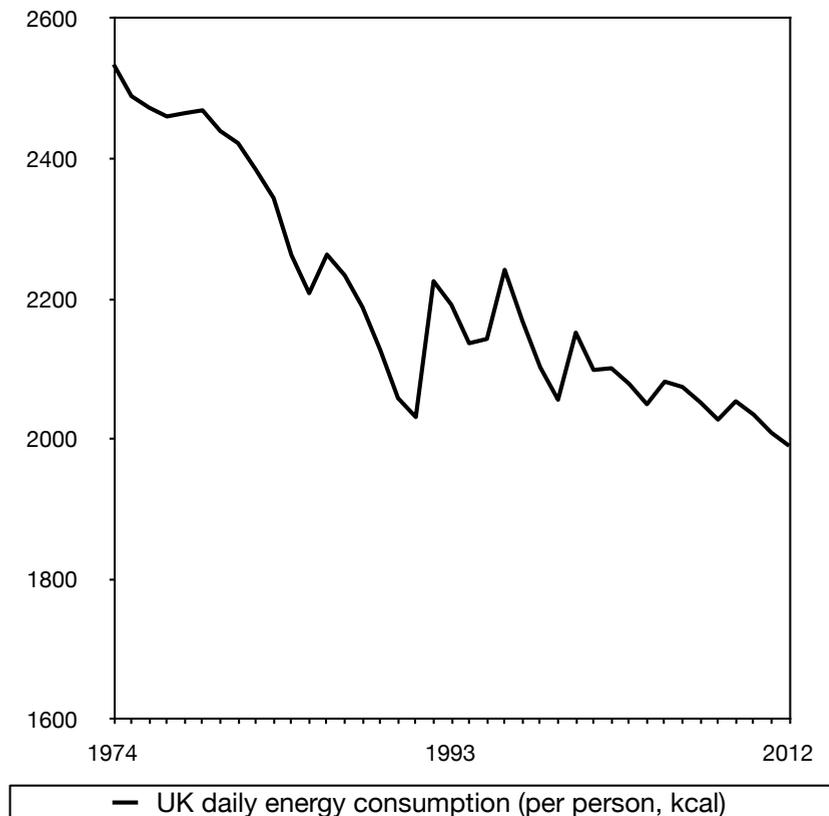


Figure 3: Per capita sugar consumption

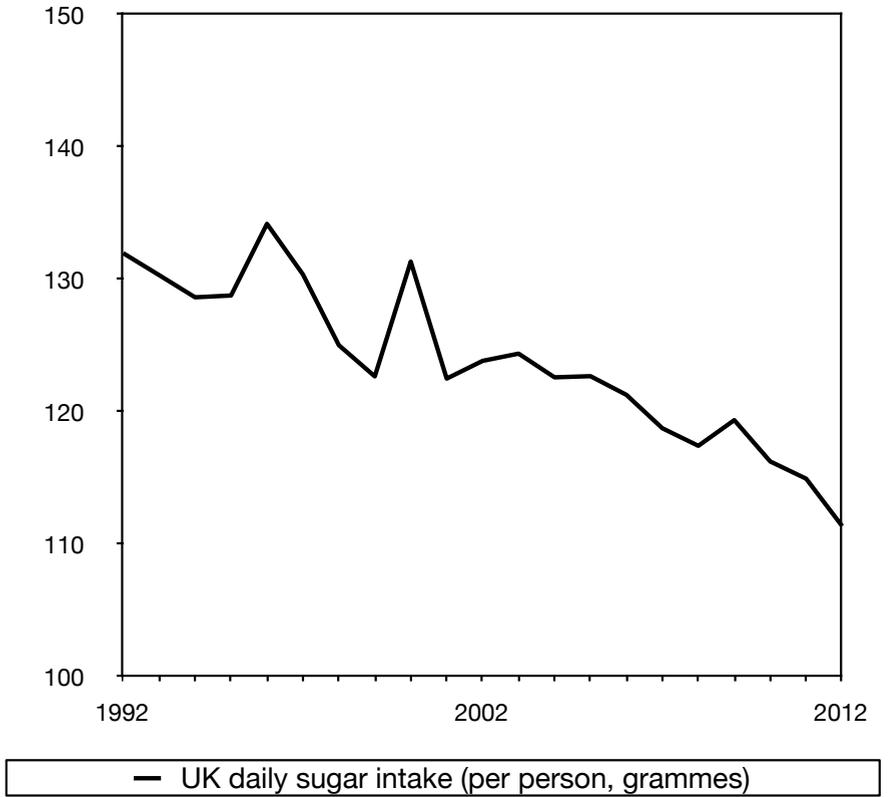
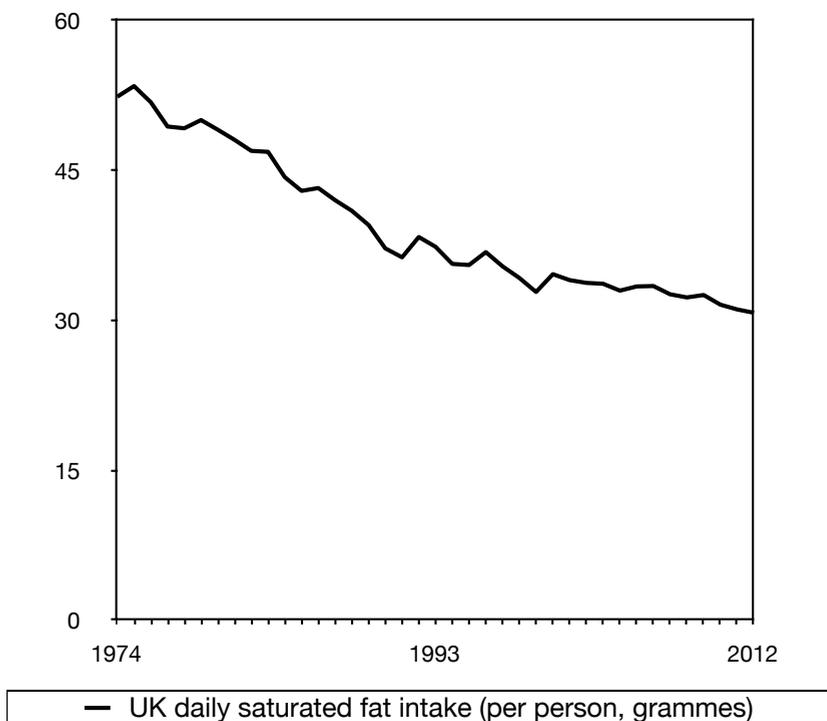
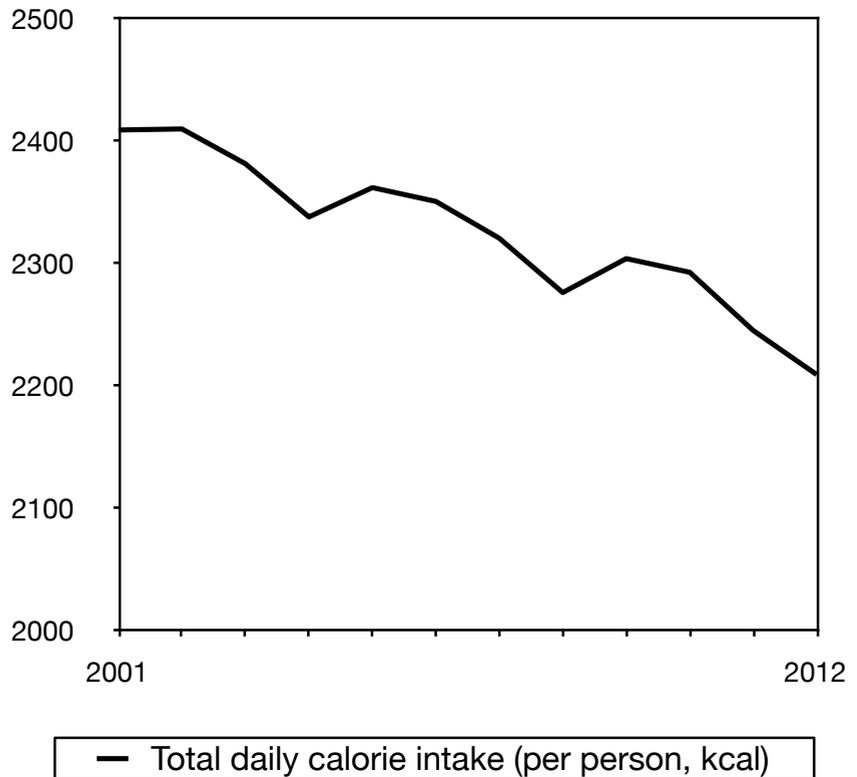


Figure 4: Per capita saturated fat consumption

All of these figures relate to food and drink consumed in the home, which accounts for 85-90 per cent of total consumption, but DEFRA also holds information on food and drink consumed outside the home. These 'eating out' figures only go back to 2001/02, but they show a significant decline in daily calories consumed, from 310 in 2001/02 to 219 in 2012. At a time when sugary snacks and fast food outlets are being blamed for fuelling obesity, it is worth noting that the evidence shows a decline in sugar consumption (from 14 grammes per day in 2001/02 to 8 grammes in 2012) and a decline in saturated fat consumption (from 4.2 grammes per day in 2001/02 to 3.0 grammes in 2012) outside the home.

Figure 5 combines the data from the household survey and the 'eating out' survey to show total per capita calorie consumption since 2001/02.

Figure 5: Total calorie consumption (per capita)

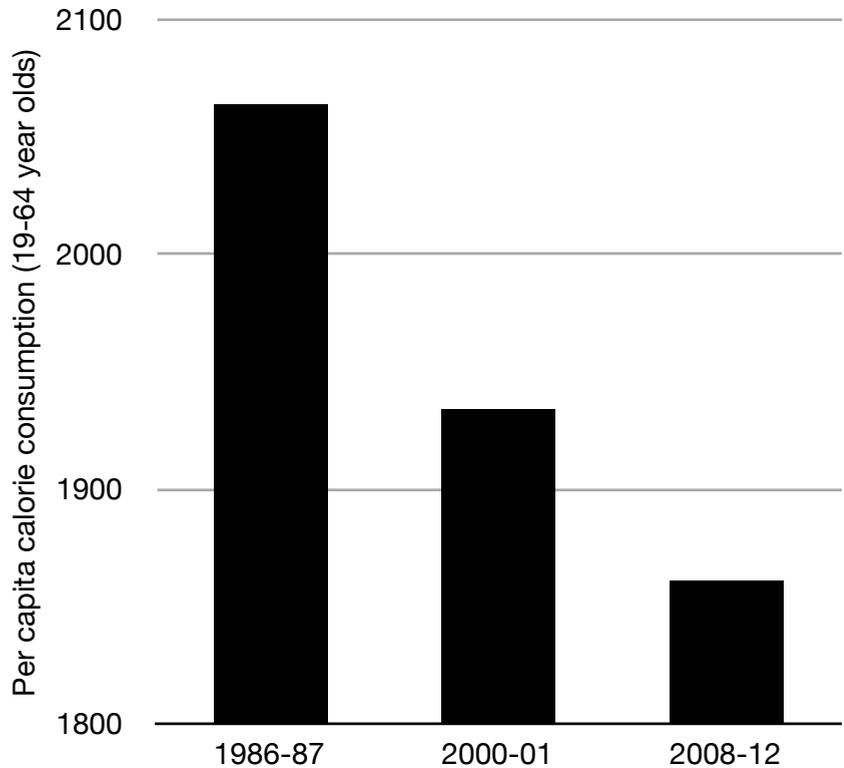


Although we do not have equivalent eating out data for the 1980s and 1990s, there is evidence that the number of calories consumed outside the home rose in the late twentieth century and peaked in the 1990s (Griffith et al., 2013: 13). If so, the downward trend from 1974 to circa 1995 is less steep than Figure 2 implies, but the direction of travel remains the same. Calories eaten outside the home are not a large enough part of the diet to skew the overall trend. Indeed, Britons were consuming more calories in the home in 1974 than Britons consumed in and outside the home *combined* in 2012.

Further evidence

The trends discussed above are corroborated by the National Diet and Nutrition Survey (NDNS) which began in the 1990s (Bates et al., 2014), the results of which can be compared to the Dietary and Nutritional Survey of British Adults which holds data for 1986/87 (Gregory et al., 1990). These surveys collect data for food and drink consumed inside and outside the home. Shown in Figure 6, they indicate that average calorie consumption has fallen by 9.8 per cent for 19-64 year olds since 1986/87. This is close to the 12 per cent reduction reported by DEFRA in the same period for the whole population. NDNS data also show declines in energy consumption since 1997 for 4-10 year olds (4.3 cent) and 11-18 year olds (6 per cent) although not for 65+ year olds.

Figure 6: Average calorie consumption (NDNS)



The NDNS study also shows that consumption of fat (including saturated fat) has declined amongst all age groups and consumption of carbohydrates (including sugars) has fallen amongst all age groups except pensioners.

In addition, the Institute for Fiscal Studies has analysed data from the Office for National Statistics' Living Costs and Food Survey and concluded that the average number of calories purchased by every type of household - single people, couples and families - declined between 1980 and 2009 (Griffith et al., 2013). Moreover, purchases fell amongst every purchasing decile; ie. those who purchased the most calories in 1980 purchased fewer in 2009 and those who purchased the least calories in 1980 also purchased fewer in 2009.

The data become less reliable as we go further back in time, but statistics collated by the British Heart Foundation (2012: 125) suggest that between 1950 and 2010 daily per capita butter consumption fell from 129 to 40 grammes and whole milk consumption fell from 2.72 litres to 0.35 litres. They also show that per capita sugar consumption fell from 287 to 90 grammes over the same period. Part of the reason may be the decline in home cooking and baking, but these figures belie the notion that Britons have only recently switched to a diet that is rich in added sugar.

George Orwell correctly noted in 1946 - during the darkest austerity years - that Britons were consuming 'about 2,800 or 2,900 calories a day' which, although considered meagre at the time, is significantly more than the amount recommended today (Orwell, 1946). The physicality of life and work in the 1940s meant that obesity was rare. Indeed, it appears that a diet of less than 2,900 calories per day led to Britons losing weight (Harries and Hollingsworth, 1953: 77).

Limitations

Measuring the diet of the nation is not an exact science. Researchers rely on individuals keeping track of what they eat over a period of several days and it is well known that people tend to under-report the amount of food they consume due to a desire to deceive or - more commonly - a tendency to forget (over-reporting is also possible, though less common). The alternative method of keeping till receipts to check what food has been purchased is also problematic because some food is thrown away.

Researchers are well aware of these issues and have ways of testing the degree of under-reporting, notably with urine tests using 'doubly labelled water' which show how much energy a person has expended (and, therefore, how much energy a person of steady weight has consumed). Nevertheless, it is believed that Britons throw away about 10-20 per cent of the food they buy and under-report how much they eat by around 20 to 40 per cent (WRAP, 2013; Macdiarmid and Blundell, 1998).

When studying dietary trends over time the question is not whether people under-report but the extent to which under-reporting has changed over the years, if at all. Women and the obese are most likely to under-report and whilst the proportion of women in the population has remained stable, the proportion of obese people has clearly increased. It is therefore possible that more obesity has led to more under-reporting, but it is very unlikely that the population has become so forgetful and dishonest that the large, steady and

virtually uninterrupted decline in calorie consumption reported in successive studies can be explained by misreporting alone.

Energy in, energy out

As we have previously argued in relation to alcohol (Duffy and Snowdon, 2014), a reduction in consumption at the population level is no guarantee of a reduction at the individual level. Although *average* consumption of calories has declined, this does not preclude the possibility of some individuals ('deviants' in epidemiological terms) consuming much larger quantities. However, there is little evidence that the numbers are being averaged out by non-obese people getting thinner while obese people get fatter. On the contrary, about a half of the non-obese population is overweight, leaving only a minority of 'normal weight'.

If we look at the *average* body mass of English adults since 1993, we see a steady increase from 72.4 kg to 77.4 kg (Figure 7). This seven per cent increase contrasts sharply with the data from DEFRA which shows a decline in domestic calorie consumption of nine per cent in the same period (Figure 8). If we confine ourselves to the period 2002-12, for which we have solid data for food consumed inside *and outside* the home, we see the same 'paradox': an increase in average body weight of two kilograms coinciding with a decline in calorie consumption of 4.1 per cent and a decline in sugar consumption of 7.4 per cent.

Figure 7 gives us a measure of the amount of energy stored by the nation while Figure 8 gives us a measure of the amount of energy consumed by the nation. The crucial missing variable, often overlooked by campaigners, is energy *expended*. If the average

person burnt the same number of calories in 1993 as she burns today, these two graphs would be irreconcilable. Assuming that both the data and the laws of thermodynamics are correct, the average person must be burning off fewer calories than she did in the past.

Figure 7: Average body weight 1993-2012

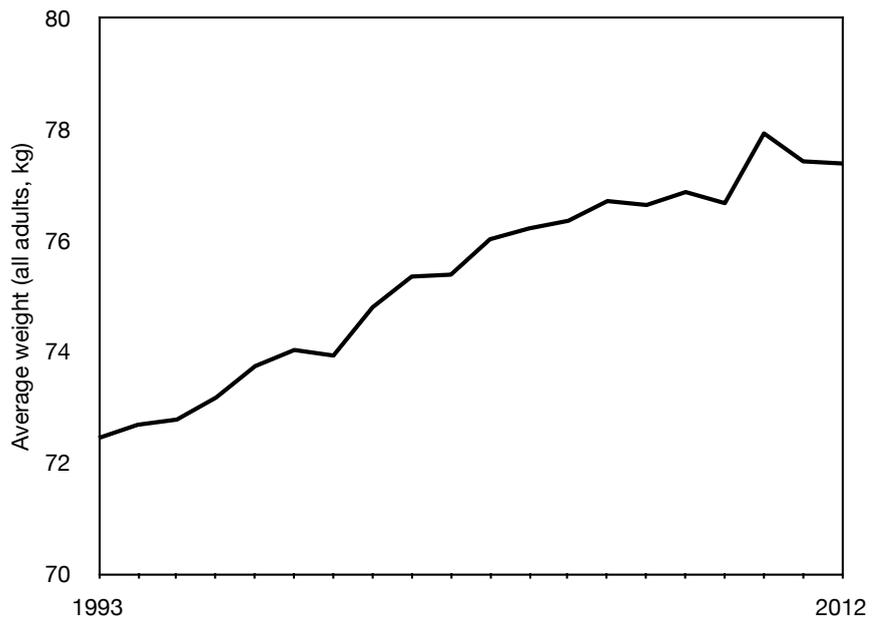
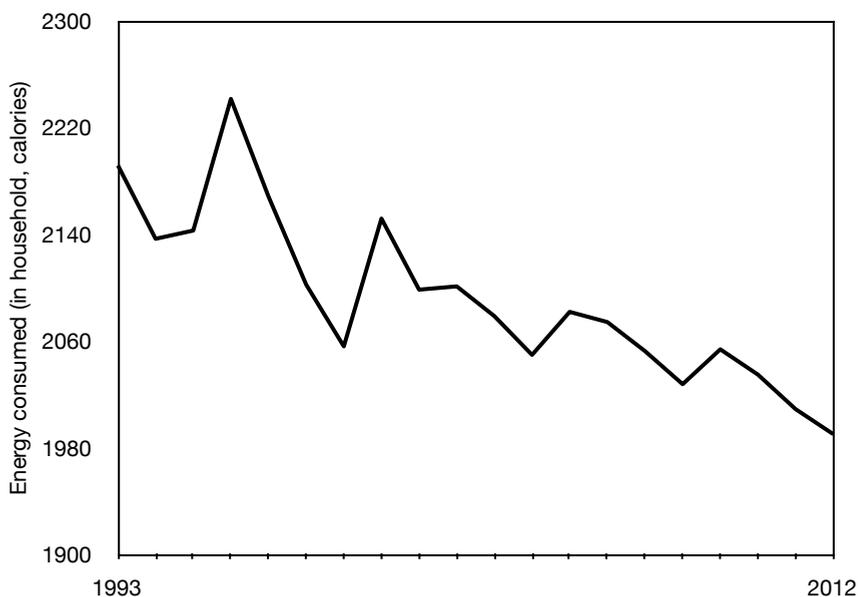


Figure 8: Average calorie consumption 1993-2012



This logical conclusion is supported by the data. Those who blame 'Big Food' for the rise in obesity sometimes claim that Britons are more physically active than in the past, but this is based on a modest rise in the number of people who claim to abide by the government's recommendation of taking 30 minutes vigorous exercise five times a week. This number rose from 26.5 per cent to 37.5 per cent between 1997 and 2012, but these people remain in the minority and the recommendations relate only to leisure activities (Scholes and Mindell, 2013: 32). If one looks at day-to-day exercise and occupational physical activity, it becomes clear that lifestyles have become more sedentary.

The transition from manual labour to office work saw jobs in agriculture decline from eleven to two per cent of employment in the twentieth century while manufacturing jobs declined from 28 to 14 per cent of employment (Lindsay, 2003). Britons are walking less (from 255 miles per year in 1976 to 179 miles in 2010) and cycling less (from 51 miles per year in 1976 to 42 miles in 2010). Only 18 per cent of adults report doing any moderate or vigorous

physical activity at work while 63 per cent never climb stairs at work and 40 per cent spend no time walking at work (British Heart Foundation, 2012b: 58-59).

Outside of work, 63 per cent report spending less than ten minutes a day walking and 53 per cent do no sports or exercise whatsoever (*ibid.*: 52-4). Add to this the ubiquity of labour-saving devices and it is clear that Britons today have less need, and fewer opportunities, for physical activity both in the workplace and at home. Put simply, they have reduced the number of calories they consume, but they have reduced the amount they move around even more.

Conclusion

The weight of evidence strongly suggests that the rise in obesity since 1980 has not come about as a result of increased energy consumption, rather it has come about *despite* a marked reduction in energy consumption. Any attempt to pin the blame on specific ingredients, such as sugar and saturated fat, is hindered by the inconvenient truth that consumption of these nutrients has also declined.

It is true that high energy food is widely available and is relatively cheap. It is also true that some people on the tail of the distribution curve eat much more than average. Nevertheless, it is very difficult to argue that the rise in average body weight is the result of an increase in average calorie consumption since no such increase has taken place. Obesity is, by definition, the result of excess calorie consumption, but the root cause of the rise in obesity in Britain in recent decades has not been a rise in energy intake but a decline in energy expended. Predictive modelling based on the assumption that removing calories from the food supply (whether as sugar, fat or anything else) will reduce average body weight should take into account the real world evidence presented above.

Obesity features so often in the media that it is surprising that the data shown in this briefing paper are not better known. The myth that Britons are consuming more and more food has persisted for the following two reasons.

Firstly, there is a tendency to import narratives from the USA where, in contrast to the UK, calorie consumption rose in line with obesity rates for many years. This dual trend had come to an end by 1990, however, and the role of chronic physical inactivity is beginning to be acknowledged as the driver of rising obesity in the years since (Ladabaum et al., 2014).²

Secondly, the food supply is a more inviting target for health campaigners than the sedentary lifestyles of the general public. A war against 'Big Food' requires no stigmatisation of individuals (other than the individuals who work in the food industry) and there are a readymade set of policies available which have been tried and tested in the campaigns against tobacco and alcohol. Instigating such a war, however, requires the public to believe that food companies have acted unscrupulously by stuffing unwitting consumers full of calories, forcing large portions upon them and spiking their meals with sugar and fat. The data shown in this paper are clearly not helpful to that narrative.

Such is the sensitivity of the public health lobby to this sort of information that when two researchers published a paper showing that sugar consumption had been declining in Australia for thirty years while obesity had been rising (Barclay and Brand-Miller, 2011), they were branded 'a menace to public health' and investigated for scientific misconduct (Safi, 2014; Carlisle, 2014). They have since been exonerated, but the title of their study - 'The Australian Paradox' - highlights how deeply rooted is the belief that obesity can only be the result of increased sugar and/or calorie consumption at the population level. As the evidence from the UK - and, in recent times, the USA - shows, it is no paradox at all.

2 Ladabaum et al. note that 'Our findings do not support the popular notion that the rise in obesity in the U.S. can be attributed primarily to sustained increases over time in the average daily caloric intake of Americans.'

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