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The culprit may be fructose

Consumption of glucose reduces blood flow in the hypothalamus – the part of the brain that controls appetite and hunger – but consumption of fructose does not. Also, fullness and satiety are increased after consuming glucose, but not after consuming fructose. This was found in a study of young healthy volunteers: 10 men and 10 women of normal weight. The study had a blinded, random order, crossover design, and all participants drank 75 g preparations of pure glucose or fructose. During the next hour, functional magnetic resonance imaging was used to study blood flow in the brain, and a visual analogue scale was used to assess satiety, hunger, and fullness.

Consumption of glucose reduced blood flow in the regions of the brain that control appetite and reward, which in addition to the hypothalamus include the thalamus, insula, anterior cingulate, and striatum. Blood flow was reduced in the thalamus in response to fructose, but also in entirely different regions: the hippocampus, posterior cingulate cortex, fusiform and visual cortex. Fructose also resulted in lower concentrations of plasma insulin and the satiety hormone glucagon-like polypeptide 1.

Increases in obesity have paralleled the increased consumption of added sugars, including fructose. Although obesity is ultimately caused by excess energy intake, sensations such as hunger and fullness are major determinants of how much people eat. Because fructose seems to make people eat more, its intake should be reduced. Sucrose and high-fructose corn syrup, which contain about equal amounts of fructose and glucose, are added to sodas, as well as energy and sports drinks. They are also added to juices for small children and many processed foods, including meats and sauces.

Page KA, et al. JAMA 2013;309:63-70. [http://dx.doi:10.1001/jama.2012.116975]

Overweight people live longer

Contrary to expectations the overweight live longer, according to a recent systematic review published in *JAMA*. A body mass index (BMI) of 18.5 - \leq 25 is considered normal. This review found the lowest



all-cause mortality among people with a BMI of 25 - $<$ 30, who are considered to be overweight. The review identified 143 papers and 97 studies comprising 2.8 million people, which were pooled in a meta-analysis.

Compared with a normal BMI, hazard ratios for all-cause mortality were 0.94 (95% CI 0.91 - 0.96) for overweight, 1.18 (1.12 - 1.25) for obesity overall (BMI \geq 30), 0.95 (0.88 - 1.01) for grade 1 obesity (BMI 30 - $<$ 35), and 1.29 (1.18 - 1.41) for grades 2 and 3 obesity (BMI \geq 35). Researchers examined the role of various confounders and biases, and the results were consistent across analyses.

It could be that risk factors are better managed in overweight and obese people, but we also know that BMI and mortality are inversely related in the presence of a wasting disease, heart or kidney disease, diabetes, and old age. The results could also be an artefact; in most studies, the lowest



all-cause mortality was seen in patients with a BMI of 22 - 25, but the 'normal' range also includes people with a BMI of 18.5 - 22 who have a higher mortality.

Flegal KM, et al. JAMA 2013;309:71-82. [http://dx.doi:10.1001/jama.2012.113905]

Dietary sugars and body weight

The aim of this review was to summarise evidence on the association between intake of dietary sugars and body weight in adults and children. The authors used a systematic review and meta-analysis of randomised controlled trials and prospective cohort studies. The data sources were OVID Medline, Embase, PubMed, Cumulative Index to Nursing and Allied Health Literature, Scopus, and Web of Science (up to December 2011).

Thirty of 7 895 trials and 38 of 9 445 cohort studies were eligible. In trials of adults with *ad libitum* diets (i.e. with no strict control of food intake), reduced intake of dietary sugars was associated with a decrease in body weight (0.80 kg, 95% confidence interval 0.39 - 1.21; p $<$ 0.001); increased sugar intake was associated with a comparable weight increase (0.75 kg, 0.30 - 1.19; p =0.001). Iso-energetic exchange of dietary sugars with other carbohydrates showed no change in body weight (0.04 kg, -0.04 - 0.13). Trials in children, which involved recommendations to reduce intake of sugar-sweetened foods and

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beverages, had low participant compliance to dietary advice. These trials showed no overall change in body weight. However, in relation to intakes of sugar-sweetened beverages after one year follow-up in prospective studies, the odds ratio for being overweight or obese was 1.55 (1.32 - 1.82) among groups with the highest intake compared with those with the lowest intake. Despite significant heterogeneity in one meta-analysis and potential bias in some trials, sensitivity analyses showed that the trends were consistent and associations remained after these studies were excluded.

Among free living people involving *ad libitum* diets, intake of free sugars or sugar-sweetened beverages is a determinant of body weight. The change in body fatness that occurs with modifying intakes seems to be mediated via changes in energy intakes, as iso-energetic exchange of sugars with other carbohydrates was not associated with weight change.

Te Morenga L, Mallard S, Mann J. *BMJ* 2013;346. [<http://dx.doi.org/10.1136/bmj.e7492>] (Published 15 January 2013.) *BMJ* 2013;346:e7492.

Antibiotics not needed for coughs

A recent article in *JAMA* tells us what we all know already – uncomplicated bronchitis does not need to be treated with antibiotics. Researchers in the USA tested a complex intervention to discourage

inappropriate antibiotic prescribing and found a significant decrease in primary care antibiotic prescriptions over the winter period. The intervention took the form of printed leaflets, posters and algorithms, as well as similar materials incorporated into computerised decision support. Prescriptions for antibiotics fell from 80% to 67% among patients with bronchitis in the print strategy group and from 74% to 61% in the computerised strategy group. Control practices saw a slight rise in prescriptions.

However, a linked editorial in the same issue suggests that this is not really an effective way to change doctors' behaviour.

We have known this for 40 years and should be aiming for a prescription rate of less than 10%. The suggestion is that the education needs to be in wider society and that we need to be clearer with patients about exactly what they can expect from antibiotics – side-effects and little change in the course of their illness. Perhaps the rise in prescribing rates in the control practices is because the patients who really wanted an antibiotic simply went elsewhere.

Gonzales R, et al. *JAMA Intern Med* 2013. [<http://dx.doi.org/10.1001/jamainternmed.2013.1589>] (Published online 14 January 2013.)



SINGLE SUTURE

Wealth but no health

Wealthy it may be, but healthy it is not. The US population experiences poorer health at all stages of life than the populations of 16 other rich countries. Despite leading the world in pioneering anti-smoking laws, cancer screening and controlling high blood pressure, the US trails its richer 'peer' countries in almost all other measures of health and longevity, says a US National Research Council report published recently.

At 75 years, men in the US have the lowest life expectancy in the group, while women have a life expectancy of 81 years – higher only than Denmark. In nine categories of ill health ranging from infant mortality rates to the prevalence of sexually transmitted disease, US citizens consistently came at or near the bottom of the table. 'I was stunned by how pervasive the disadvantages were across so many factors,' says Steve Woolf of Virginia Commonwealth University in Richmond, who chaired the report panel.

Woolf and his colleagues say that the problem has less to do with faults in the US health system, and more with behaviours that put US citizens at greater risk. 'They consume the most calories per person, have higher rates of drug abuse, are less likely to use seat belts, and are more likely to use firearms in acts of violence,' says Woolf.

New Scientist, 19 January 2013