Commentary: Why diets need to change to avert harm from global warming

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In this issue, Edwards and Roberts identify a connection between dietary affluence and impending harm from climate change that has so far attracted little notice. Fat populations, they argue, need more food (mainly to support their extra lean mass), and so amplify the greenhouse gas (GHG) emissions from food production. Fat bodies also need more fossil fuel to carry them around in cars and planes.

To elaborate their argument, they construct two hypothetical middle-aged populations of 1 billion with equal numbers of males and females. Male heights are set at 1.75 m and female heights at 1.60 m. One population is assigned a ‘normal’ body mass index (BMI) distribution with a mean of 24.5, with only 3.5% >30.0—which is claimed to correspond to the UK in the 1970s. The ‘overweight’ population is given a BMI distribution ‘predicted for the UK in 2010’, with a mean of 29.0, and 40% >30.0 (obese). The authors estimate that the ‘overweight’ population would eat 19% more food, on the fragile assumption that their daily activity patterns were the same as the ‘normals’. Assuming further that the hypothetical 1 billion middle-aged ‘normals’ are equivalent to an average one-sixth of the total human population in their GHG emissions, the extra food needs of the ‘overweights’ would add 0.27 GT of CO₂ equivalents (CO₂e) to food-based emissions per year. To this, is added an extra 0.19 GT to transport the additional adipose tissue. The ‘overweight’ population is, however, more likely to be representative of heavy GHG emitters in high-income countries than of humanity in general. Allowing for this would push absolute emission increases upward. The authors conclude that the difference in emissions between the normal and overweight billions are likely to lie between 0.4 and 1.0 GT/year—equivalent, very roughly, to between 1 and 2% of the recent emissions from the total human population.

As the authors imply, it may not be easy to extrapolate from hypothetical middle-aged populations to actual human populations. Furthermore, if higher levels of physical activity play any role in helping the ‘normals’ to avoid being overweight, this will reduce the difference in food energy requirements.

Edwards and Roberts’ contribution adds to arguments that are directing attention to diet when strategies to avert harm from global warming are being considered.

Even more consequential than the quantity of food consumed is its composition. Animal foods currently supply about one-third of dietary energy in high-income populations, but they contribute disproportionately to GHG emissions. An influential FAO report has estimated that animal foods contribute ~18% of global GHG emissions—more than transport. This estimate includes important but more uncertain ‘second-order’ effects on land use and land use change, e.g. deforestation for soy production.

Because the tendency to consume more animal products as incomes rise is so strong, ‘business as usual’ projections to 2050 have global animal production doubling, with most of the increase occurring in low- and middle-income countries. However, business will not be able to continue ‘as usual’. Finding paths to globally sustainable patterns of animal food production and consumption should therefore be central to climate change policy deliberations. On grounds of geopolitical feasibility (as well as equity), there is no obvious alternative to a policy of ‘contraction and convergence’—contracting consumption levels in rich countries to leave room for consumption in poor countries to converge upwards.

If we seek only to achieve the conservative objective of avoiding further long-term increases in GHG emissions from livestock, we are still led to rather radical recommendations. Taking the example of meat, a global mean consumption level of somewhat less than the current 100 g/day would be needed for the predicted 9 billion plus population in mid-century. (These data are for ‘consumption’ in the economic sense of ‘using up’ and include, for example, household wastage. Actual intake might be 20% or so less.) This would require more than halving current consumption levels in affluent countries—an unlikely outcome if there were no direct rewards to citizens for doing so. Fortunately, there are such rewards: important health benefits can provide a ‘second dividend’
for reducing meat consumption in high-income countries.

Recently reported results from the US National Institutes of Health-AARP Diet and Health Study—a cohort of half a million recruited at the age of 50–70 years and followed for 10 years—provide some guidance on the size of the likely health dividend.5 When the cohort was divided into fifths by (energy adjusted) red meat intake, males and females in the bottom fifths of their respective distributions (with mean red meat consumption ~7- to 8-fold lower than those in the top fifth) enjoyed an all-cause mortality advantage of about one-quarter when compared with those in the top fifth. Interestingly, white meat consumption did not vary across the fifths of red meat consumption. Thus, a dietary pattern already adopted by one-fifth of the late middle-aged US adults could, if generalized across the populations of high-income countries, yield both enhanced sustainability and better health.

The gains in sustainability would arise in part from the greater proportional reduction in red meat consumption. GHG emissions (as well as other adverse environmental effects such as water use) are much higher per unit product for red than for white meat.6 Epidemiologists and public health professionals can play an important role in quantifying the health risks and benefits of possible trajectories to globally sustainable diets. Meanwhile, diet continues to be evaded in climate policy discussions: it was apparently one inconvenience too far for Al Gore7 (compare with ‘Meat the truth’8). In the UK, official policy focuses exclusively on ‘CO2’, not ‘CO2e’, thus by-passing the important contributions of GHGs, such as nitrous oxide and methane, associated with meat production. Advice on ‘Buying food and drink’ notes that food accounts for ‘nearly a third of individuals’ contribution to climate change’, but none of the suggested six ‘simple changes’ includes buying less meat (http://campaigns.direct.gov.uk/actonco2/home/out-shopping/buying-food-and-drink.html).

Telling people what to eat is, of course, a politically delicate matter.9 However, ‘absolute dietary freedom could soon, lamentably, become a luxury’.10

Conflict of interest: None declared.

References

6 Pimentel D, Pimentel M. Sustainability of meat-based and plant-based diets and the environment. Am J Clin Nutr 2003;78 (Suppl.3):660S–3S.