

The dilemma of healthy eating and environmental sustainability

Angie Clonan and Michelle Holdsworth, University of Sheffield, UK



Sustainability has become fundamental to many global policy agendas in areas relating to human impact on the earth's resources, such as food production and consumption.

Much of the work in this regard has focussed on the environmental dimension of sustainable food production and consumption, which in itself spans an extensive subject area, covering a broad range of issues often interconnected, as table 1 illustrates. Research conducted in these areas has shown that UK consumers could face dramatically reduced food choices in the future unless much more is done to lower the environmental impact of current food consumption patterns[1]

Policy background

Considerable progress was made in underlining the need for a sustainable food policy in the UK through the work of the Sustainable Development Commission^[2], which was dissolved in 2010 following the election of a new Conservative government. In May this year the House of Commons Environmental Audit Committee published its report on

Sustainable Food concluding that "Government must develop a joined-up strategy to change the UK's unhealthy and environmentally damaging food system, as fears mount about global food security"^[3]. The Committee strongly recommended that consumers needed more knowledge and information "to make informed choices about food that is better for their health and the environment and reduces waste"^[3].

AREA	ENVIRONMENTAL IMPACT
Agriculture	Inputs, GHG emissions, soil, biofuel, biodiversity, land use, water use
Climate change	GHG emissions, wider impacts/effects, food security
Land use	Maximising production, soil, deforestation, energy crops, food security
Consumption	Behaviours, labelling, environmental impacts
Fish	Aquaculture, climate change, consumption, policies
Waste	Food waste, packaging, recycling, environment
Water	Bottled, drought, management and sustainability
Life cycle analysis	Models, meat, milk, water, retail

There are clear tensions between healthy eating messages provided to the UK public and environmental sustainability, mainly in the consumption of meat, dairy foods and fish^[4]. Additionally the vast array of 'sustainable' labelling schemes add complexity to the purchasing context, making it difficult for even the most informed consumers to make 'sustainable' choices^[5]. As yet, the UK government do not provide consumers with any advice on sustainable food or indeed sustainable consumption of wider goods and ser-

vices. 'Sustain' are a non-governmental organisation (NGO) operating in the UK, and currently offer the most accessible form of guidance for anyone seeking to consume food in a more sustainable fashion^[6]. Sustain's advice is provided in table 2, and is similar to guidelines developed by both the German Council for Sustainable Development^[7] and Sweden's National Food Administration^[8].

Meat and dairy consumption

There is presently a robust and growing evidence base underlining multiple gains for human and environmental health through a reduction of meat and dairy products. The most recent study undertaken in the UK illustrates that **a sustained reduction in red and processed meat in the UK population would reduce the incidence of coronary heart disease, diabetes mellitus and colorectal cancer**, by 3%–12%^[9]. **The associated reductions in GHG emissions are predicted to equate to almost 28 million tonnes of CO2 equivalent/year**^[9]. Not surprisingly, the World Cancer Research Fund (WCRF) advocates reducing red meat intake in the diet^[10], and the UK's Department of Health have recently followed suit advising "If you currently eat more than 90 grams (cooked weight) of red and processed meat a day, the Department of Health advises that you cut down to 70 grams"^[11].

However, alongside this, UK dietary guidelines currently state "Meat is a good source of protein in your diet, as well as vitamins and minerals"^[11]. This underlies a long standing assumption that meat and dairy products are good for human health^[12]. Clearly, protein is an essential dietary component, and whilst it is unlikely that large numbers of people in the UK suffer from a protein deficiency, as current estimated average intakes are around 66g for women, and 88g for men (almost double the requirements)^[13], national survey data show that on average iron intakes are already below recommended levels for both men and women^[14]. There may be potential nutritional risks of reducing dairy products in terms of calcium deficiency^[15], and suitable alternatives should be explored to prevent this. One such option may be calcium enriched soy dairy alternatives, which are a good source of calcium, low in saturated fat, high in omega-3 fat, sustainable and 100% plant-based.

In terms of contribution to greenhouse gas emissions (GHGs), per capita levels of meat consumption currently observed in the UK (83.9kg/person/year)^[16, 17] are both unsustainable and a poor input – output resource use when compared to plant based foods^[17]. However, differ-

ences in both type of meat (e.g. beef, pork), and production method (e.g. intensive, grass-based) also influence the environmental impacts of meat consumption, further complicating the scenario. This presents an arduous selection process for consumers when trying to evaluate the sustainability of meat production impacts with the positive and negative nutritional consequences of meat consumption.

Public education campaigns, such as the Barsac declaration, (undertaken by the European Science Foundation), **seek to engage the individual by means of a personal pledge to significantly reduce personal meat consumption**. This acknowledges the idea of personal responsibility for the environment and that individuals' choices can make a difference^[18]. Purchasing contexts require even greater consideration, to explore how retailers can influence meat purchasing decisions by choice editing at a food supply level, thereby ensuring consumers can purchase meat which is healthy and has been reared with high standards of animal welfare and environmental sustainability in mind. Pricing mechanisms supported by policy measures which **promote plant based agriculture to produce healthier legumes, vegetables, and other selected crops**, instead of subsidising animal source foods (as has been the case historically alongside non-vegetable arable crops) could incentivise consumers to lower their intakes of meat and dairy. **This could have the added advantage of reducing saturated fat intake, and of increasing intake of plant based foods**^[19]. However, it is important to consider how any fiscal measures may affect certain groups of the population, for example pregnant women and younger children who may be at risk of developing micronutrient deficiencies and for whom cost may be already a barrier to accessing quality sources of protein^[20].

The evidence base should consider how best to meet not just protein, but iron, calcium and selenium requirements from other, less environmentally costly dietary sources. **Although UK dietary guidelines do advise a reduction in red and processed meat consumption, meat has become deeply entrenched in the UK diet**, and consideration needs to be given to social and cultural norms which will need to undergo a massive shift to obtain the necessary reductions in consumption in order to facilitate environmental sustainability.

SUSTAIN ADVICE (UK)	GERMAN SUSTAINABLE DEVELOPMENT COUNCIL	SWEDEN'S NATIONAL FOOD ADMINISTRATION'S ENVIRONMENTALLY EFFECTIVE FOOD CHOICES
Buy local, seasonally available ingredients as standard.	Choose seasonal fruit and vegetables grown locally	Choose seasonal and locally grown fruits, berries, vegetables, legumes, potatoes, cereals
Buy food from farming systems that minimise harm to the environment, such as certified organic produce.	Choose certified organic products (preferably German)	Choose pesticide free products where available, for example organic
Reduce the amount of foods of animal origin (meat, dairy products and eggs) eaten.	Consume less meat Buy only free range eggs	Reduce meat intake Replace meat meals with vegetarian Choose local meat, preferably grass fed Choose organic if local unavailable
Stop buying fish species identified as most 'at risk' by the Marine Conservation Society (MCS).	Consume less fish Choose certified sustainable, for example MSC labelled fish	Choose fish from stable stocks Choose certified sustainable for example MSC labelled fish Try something new
Choose Fairtrade-certified products for foods and drinks imported from poorer countries.	Choose Fairtrade certified products	n/a
Avoid bottled water and instead drink plain or filtered tap water.	Choose beverages in recyclable packaging units	Choose tap water whenever possible If buying packaged water choose local
Protect health and well-being by making sure meals are made up of generous portions of vegetables, fruit and starchy staples such as wholegrains, cutting down on salt, fat and oils, and cutting out artificial additives.	Consume healthy foods products Aim for plant-based foods Drink non-alcoholic beverages Cut down on animal products, fatty foods, sweets and alcohol	Choose fibre rich vegetables (root vegetables, broccoli, white cabbage, onion) as they can be kept for longer periods, and are produced locally all year round
		Cooking fat Choose rapeseed oil or olive oil Reduce palm oil Limit butter consumption

Fish consumption

It is clear that consumption of fish and fish products has a considerable impact on human nutrition, the marine environment, and the long term viability of fish stocks, yet tensions remain between dietary advice provided and environmental capabilities in this regard. UK dietary guidelines currently recommend consuming at least two portions of fish per week, one of which should be oily^[21], as regular fish consumption is associated with decreased risk of several health problems including cardiovascular disease^[22] and cancer^[23].

If every person in the UK population achieved the recommendations for fish intake^[24], demand would increase on fish stocks in the EU and around the world which are already under pressure^[25]. Estimates indicate that over three-quarters of the world's^[26] and EU's^[27] fish stocks are currently either fully or over-exploited. For consumers, balancing health motivations with concerns over sustainability can present something of a dilemma, particularly as very little guidance is available. Many UK consumers buy fish for health reasons indicating that the dietary advice has been heeded; however there appears to be less awareness

regarding sustainability issues when purchasing fish, and the growth in aquaculture (farmed fish), whilst welcomed by some, is currently adding to the confusion for consumers^[28].

Whilst UK consumer guidance for fish consumption has been recently updated to incorporate some information on sustainability, the headline message for consumers to increase fish consumption remains unchanged^[29]. Recommendations still include several types of fish that the UK's Marine Conservation Society (MCS) believe are most vulnerable to over-fishing and/or are fished using methods that damage the environment^[30]. The Marine Stewardship Council (MSC) provides certification via the use of its eco-label to communicate whether a fish or fish product is from a sustainable source. Additionally, the MCS provides a 'pocket guide' for consumers^[30] listing fish from sustainable sources and those to be avoided. However guidelines on fish consumption need to be clarified in order to communicate the complex information to consumers about choosing fish from sustainable sources.

Fruit and vegetables



Just Eat More
(fruit & veg)

For almost a decade, UK dietary guidance has heavily promoted the consumption of 5 fruit and vegetables per day, with no consideration being given to the origin, transport methods, or indeed packaging implications of this produce^[31]. Whilst lower in environmental impact, evidence suggests that fruit and vegetable (including potato) consumption accounts for around 2.5% of the UK's total GHG emissions^[32]. Garnett highlights air freighted produce, unseasonal Mediterranean style produce, prepared (trimmed or chopped) produce, and fragile or highly perishable produce as the major GHG contributors of the sector^[32]. Again, purchasing contexts require consideration, as research carried out in the UK summarised that most fruit & vegetables available through major UK retailers at best only partially met sustainable guidelines, and some retailers did not offer fruit or vegetables meeting any sustainability criteria^[33]. This presents a real challenge for UK consumers to make environmentally sustainable choices when buying fruit and vegetables in mainstream situations.

Eating out

A substantial proportion of food is now consumed away from home, and in this scenario consumers may be less inclined or indeed able to give adequate consideration to both the healthiness and the environmental impact of the foods purchased. As these food decisions are largely based on convenience or impulse, consumers often assume that decisions on ethical issues will have been made for them by the retailer in question^[34]. Therefore responsibility needs to be taken by the catering sector to ensure that the food offered has been sustainably sourced^[35]. The revision of dietary guidelines would be helpful in this regard, as it would allow the industry to tackle the provision of healthier food alongside strategies to ensure the sustainability of their catering services.

Integrating sustainable consumption with a healthy diet

Research findings highlight potential synchronicities between sustainable food production and healthier dietary intakes in nutritional terms^[36], however further exploration of how sustainable food systems can be integrated

with improving dietary intake is required to build a robust evidence base.

The WWF considered how this could be done using the Eatwell plate which forms the basis of the UK's current dietary guidelines^[37]. The report highlighted that current dietary intake in the UK is too high in saturated fat, sugar and salt, and too low in fibre as well as contributing high GHG emissions, and is therefore not sustainable for health or the environment. However it also noted that a diet which meets both recommendations for health and GHG emission reduction targets for 2020 can be achieved by rebalancing the nutrient intake and reducing the consumption of meat based proteins^[37]. Working on proposed GHG reductions as set out by the government, the report proposed the revision of the Eatwell plate, entitled the 'Livewell diet' to reflect reductions to certain food groups for example, meat, and increases to others, for example bread, rice and potatoes. Therefore there is the possibility of communicating this information with the public by adapting the existing model for healthy eating promotion (i.e. the Eatwell plate). In order to initiate the shift in consumption necessary to meet the extra reductions in GHG emissions set for 2050, this should be considered as a matter of priority.

Dietitians, nutritionists and policy makers need to work together to ensure that dietary guidelines go beyond consideration of current consumers to encompass the nutritional, environmental and resource needs of future generations. Issues such as local and seasonal food, meeting nutritional demands within a fixed budget, packaging and animal welfare have been shown to be important to consumers^[38], and these should be utilised to communicate the need for behaviour change in dietary consumption patterns.

Evidence base

Much of the research seeking to understand sustainable consumption has situated itself within the context of a 'consumer society'^[39] which critics argue reflects a socially constructed framework of norms, values, lifestyle choices and assumptions^[40]. Research undertaken from this perspective makes an implicit assumption of choice, which is not necessarily the case for many people in the UK, who may fall outside of 'consumer society' due to being on low income for example. A recent UK study identified that sustainable production and consumption are not issues which consumers actively think about, and sustainable purchases are motivated by eating healthily or cost^[41]. The 2008 cabi-

net office report emphasises the confusion for consumers in attempting to make more sustainable food decisions 'Behind the warm glow of "sustainable" and "local" food propositions lies the reality of a complex world in which there are few simple answers or universal solutions"^[42].

The term 'sustainable food' does not constitute language which is used every day by the public, and therefore further qualitative research could investigate lay concepts of sustainable food. Exploring differing concepts of what 'sustainable food' means to people in a qualitative manner could aid in developing a people's definition/framework for sustainable food.

Finally, the evidence base is lacking in the evaluation of interventions such as community growing projects, which are fundamental to evaluating health, nutrition and sustainability criteria collectively. Where possible, public health nutrition interventions should aim to build all three criteria into the design, and ensure that outcomes are comprehensively evaluated and information disseminated publicly, to further the knowledge base. Equitably satisfying the diverse sustainability dimensions of ecology, economy and society is challenging, and recognising that our dietary intake needs to be flexible in its ability to respond both to the environmental nature of food supply and the social dimension inherent in both production and consumption is crucial to eating food which is healthy for humans and for the planet.

References available on
www.alprofoundation.org

For more information

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The Alpro Foundation is an independent non-profit organisation, supporting and promoting scientific research in the field of health and nutrition.

Alpro Foundation VZW
Kortrijksesteenweg 1093C
9051 Sint-Denijs-Westrem
Belgium

T +32 9 260 22 11
F +32 9 260 22 99

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www.alprofoundation.org