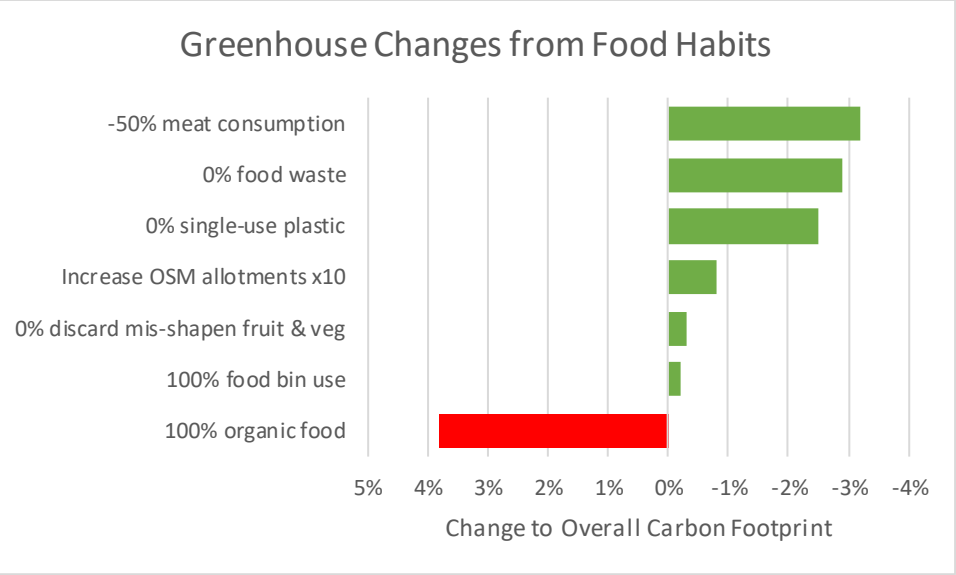
Food Carbon Footprint Reduction

Possible Changes to Food Habits

A number of possible changes to food habits have been discussed at Greener Ottery meetings and at the Devon County Council climate emergency thematic hearings. For as many of the proposals as possible, quantitative studies have been gathered and used to compare the predicted effects on Ottery's overall carbon footprint. This should allow us to prioritise Ottery's efforts accordingly.

Three other change areas were investigated but proved highly complex to quantify: food sustainability labels, consuming wild animals, consuming more local food.

Changes to farming practices are considered a different topic and will not be discussed here.



The options in the graph show potential for a 10% reduction in OSM's overall carbon footprint. Greater reductions in meat consumption, and further exploration of the changes not yet quantified will yield further reductions still. See the **Detail** section for how these figures were calculated.

Recommendations

From the above comparison three areas deserve the majority of Ottery's attention when it comes to helping locals change their habits:

- Consuming less meat
- Reducing food waste
- Reducing single-use plastic

Ottery is well-placed to address these. The food retail here is rich and diverse for this size of community. Plastic Free Ottery does excellent work in reducing single-use plastic, and we are fortunate enough to even have a packaging-free shop with Fillfull.

Support for Plastic Free Ottery

PFO has been doing great work for years and are best placed to know how to combat single use plastic locally. Here SU plastic has been quantified as a priority focus, and there will be great benefit in the council finding out what actions PFU would take if given sufficient resources and/or authority, and in working out how much of this support the council as able to give.

Awareness

All three of these measures will require general awareness spreading. This could be achieved through use of the existing social media channels, posting leaflets around town and signage anywhere that food is purchased. The material would take the form of recipe ideas (incorporating ideas from local chefs and residents), weekly meal plans, providing individual factoids etc.

Food labelling for sustainability/carbon footprint has been shown to be an effective way of keeping consumers informed [11], and while we would be unable to make changes to existing packaging, the same information could be provided on the shelving itself.

It will be important to present information in a way that demonstrates the monetary and emissions benefits of any of the behaviours being advocated.

Funding for Reduced Meat in Restaurants

There are so many delicious meal ideas with less meat in them, but not everyone is aware of these and on most menus a very limited selection is available. Ottery's eating establishments are full of talented chefs – their talents should be harnessed to get everyone excited about reduced meat options.

Rewards and recognition could be offered to any restaurant/take-away that can demonstrate they are above a target percentage of meat-free meals. Alternatively, meat-free meals could be subsidised to make them more attractive to customers.

This idea would serve two purposes: improving the sustainability of restaurants themselves, but also increase awareness of options when the public are planning their own cooking.

Green Food Club

People need help and guidance on making sustainable changes to food habits. A society could be set up that meets regularly in a place with cooking facilities – e.g. a restaurant kitchen on a closed night – where attendees could spend time with a chef and learn to cook recipes designed for left-overs and reduced meat. Funding could be provided for the cooking space and for the chef's time.

As well as a great way for people to learn and engage, this would be an ideal way to pool food that would otherwise be discarded and make sure it gets eaten. If the food volumes regularly prove too great for attendees to eat, the meals produced could be advertised for non-attendees to collect in return for nominal donations.

Not only could this be a new society, but the concept could be offered to any existing social gatherings (e.g. the Church, the Rotary Club etc.) to attend as a group for an evening. This would allow the culture and concepts to spread around OSM more widely.

Detail

Food carbon footprint

Food represents ~19% of UK carbon footprint [19]. Reducing the impact of food is therefore worth considerable attention.

-50% meat consumption

Based on source [7], looking at the difference between 'medium' meat consumption (50-100g per day) and 'low' meat consumption (<50g per day). Full 2000kcal diets are 5.63 and 4.67 kgCO2e respectively. That represents a 17% reduction in food emissions. 17% x 19% = 3.2% reduction in total carbon footprint.

Pastures are excellent carbon sequestration, and some argue that livestock production may therefore have a lower carbon footprint. However there are no supporting statistics for this claim and there are a number of reasons to doubt its validity [8].

0% Food Waste

Eliminating domestic food waste would mean a 15% reduction in food consumption ([1] – 22% is wasted, 70% of this is household). 15% x 19% = 2.9% reduction in total carbon footprint.

0% single-use plastic

Local and national figures have proven difficult to find. Globally, SU plastic is responsible for 2.5% of the total carbon footprint (0.86 GtCO2e [3] as a percentage of 33.1 GtCO2e [5]).

The carbon footprint of SU plastic comes from two factors [3]. Firstly: it represents a large and growing proportion of global manufacturing, and therefore of global manufacturing's carbon footprint. Secondly: it is a large proportion of landfill waste, which becomes relevant in places where this waste is incinerated releasing CO_2; East Devon's landfill is incinerated [4].

Increase Ottery St Mary Allotments 10-fold

With careful management, a human can be fed 100% sustainably using 370 square metres of land [6]. The current OSM allotments measure around 11,900m2 (measured from satellite imagery) – an area that could feed 32 people or 0.4% of the OSM population [17] in a fully sustainable way. Increasing the allotment area x10 could therefore make 4% of Ottery's food fully sustainable – 4% * 19% = 0.8% reduction in total carbon footprint.

0% discard of mis-shapen fruit and veg

33% of fruit and veg is not sold on cosmetic grounds [9]. Fruit and veg represents 4.2% of dietary carbon [20]. Therefore consumption of all this wasted produce would be a 1.4% reduction in dietary carbon (33% x 4.2%), and a 0.27% reduction in total carbon footprint (1.4% * 19%).

100% food bin use

East Devon council collects food waste for anaerobic digestion [2]. Food decomposition produces methane – a potent greenhouse gas. Using managed anaerobic digestion instead of landfill avoids this, as well as making maximum re-use of the digested material, with every 1 tonne of AD saving approximately 0.5 tonnes CO2e [14]. Unfortunately no CO_2e percentage figures were available so we need to estimate Ottery's actual emissions and food waste tonnage to calculate savings from increased bin use.

East Devon has notably high recycling rates [21], and a 3 week survey of bins by Greener Ottery shows that Ottery already has a 74% utilisation of the food bins [18]. Ottery can be estimated to produce around 679 tonnes of food waste (OSM has 0.01% of the total UK households – 2,884 [17] vs 27.6 million [16], which produce 6.5 million tonnes food waste per year [15]), so an estimated 177 tonnes of this is still going to landfill (679 x 26%). 177 x 0.5 = 89 tonnes CO2e that could be averted if everyone used their food bins.

Based on population scaling from East Devon's emissions [22][17], Ottery is estimated to produce 38,610 tonnes CO2e per year. 89 tonnes saved by bin use therefore represent 0.2% of total carbon emissions.

100% organic food

While organic is a more sustainable way to produce a given unit of food, a study published in Nature has found that feeding the whole country in this way would fall far short of demand, resulting in an

estimated net emissions increase of 20% [10] through increased foreign production and import. The study also accounted for the enhanced carbon sequestration of organic farming, but this was not enough to offset the emissions increases.

It is likely that increasing the proportion of animal produce that is organic, while at the same time reducing the proportion of animal produce in the diet, would be an ideal combination. But something this specific does not have the accompanying research figures to assess.

Food Sustainability Labels

There is yet to be any quantification of the possible reduction in emissions that could be achieved by using food labelling to inform consumers about sustainability. But such labelling has been shown to be effective at improving consumer knowledge [11] and could be a valuable tool in achieving the recommendations of this investigation. Bear in mind that sustainable labelling attempts in the past have taken a great deal of effort [12].

Consume Wild Animals

There are a variety of wild animal species whose numbers need to be kept in check, either due to the lack of large predators (e.g. deer) or because they are not part of the natural ecosystem in the UK (e.g. rabbits and grey squirrels). So the logic here is that it would be ecologically helpful to cull a certain level of these animals, and the meat can replace some of the UK's farmed meat demand – no land is required so this would provide rich nutrients for minimal footprint.

However, no numeric studies have been performed. We do not know how the potential for reduction in livestock farming, the resources needed for culling and butchery, the actual ecological efforts of culling and removal, nor the likely level of resistance from the public/industries. It would be inadvisable to further pursue without more information.

Consume More Local Food

We have avoided quantifying the effectiveness here since the issue is highly complex [23]. The most efficient way of getting certain nutrient will often be a foreign grown food (potassium rich fruits for example). The extra resources required to grow this source in the UK may be greater than transport from abroad, and it may be difficult/expensive to get the same nutrient level from an alternative local foodstuff.

There are no doubt benefits to be gained from encouraging the right local foods while avoiding possible pitfalls. But it would be more sensible to first focus on those other measures that quantifiably offer a benefit before entering into detailed study/debate on the subject of local food.

Sources

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