**Mentor30Engineers Entry** 18/02/18


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**Topic chosen:** 3. How do we protect the environment for the future?

What human behaviour most upsets you? It may not seem the most obnoxious crime, but I seethe with rage whenever I see anyone waste food. Being a student, I have experienced the joys of many shared kitchens, the bins overflowing with ingredients that people have thoughtlessly tossed away. In this age of food banks, it seems tragic.

It's not the sheer wastefulness alone that bothers me; the food that we buy is responsible for around 20% of our personal carbon footprint[1]. Even though this lags behind transportation and energy usage, food is an area of our lives where small changes could have a great effect. For example, asking people to give up their cars and international travel would be viewed as excessive. But getting creative with the leftover ingredients in the fridge? That's definitely more achievable.

Whether your food ends up in your stomach or the bin, the impact on the environment varies wildly deepening on what you eat and how it is produced. The amount of energy and effort that goes into bringing (say) a beef burger to your plate is colossal: rearing the cows, growing and transporting crops for cattle feed, processing, packing, refrigeration etc. That's upwards of 30kg of carbon for each kg of beef. On the other hand, your typical veggie burger would produce less than 5% of this total.

Here lies a problem. Even if you are aware of the environmental impact that food can have (and many people aren't), without extensive research it is difficult to compare the effect of your choices. Most people simply don't care enough to spend their time finding this information.

The premise of my idea is simple: to add a carbon footprint value to food labels. In the same way that nutritional traffic lighting nudges the consumer to make better decisions about their diet, an awareness of the greenhouse gas emissions could modify behaviour. I'm not suggesting that this would transform all staunch carnivores into planet-loving vegetarians, but if it were able to effect a modest reduction is the amount of meat they eat (or waste), this could add up to a sizable impact in terms of $CO_2$. With movements like 'Meatless Monday' and Veganuary gaining traction, $CO_2$ labelling would serve to encourage adoptees and introduce the idea of food environmentalism to a wider audience.

I believe that access to relevant data can be a powerful modifier of behaviour. My personal awareness of the issue began at school, when writing a report on in-vitro (lab grown) meat. Once I realised the impact that my diet was having on the planet - in particular the meat that I was eating - I took the plunge and became a vegetarian for environmental reasons.

[1] https://www.carbontrust.com/news/2012/03/food-the-carbon-story/

As an engineering student, I do like a good optimisation problem, and eliminating an entire category of food (meat) seemed like a simple yet powerful choice. Studies have shown that the average UK vegetarian is responsible for less than half of the carbon emissions of the average meat eater, so I could be confident that my personal sacrifice was worthwhile. Furthermore, the label 'vegetarian' had the added bonus that it was easy to explain to others what I eat.

But when it came to choices at a lower level, these were somewhat more difficult to navigate. For example, when getting lunch at the canteen, should I pick up an apple or a banana to go with my sandwich? I had theorised that bananas flown over from Columbia would surely cause more emissions than home-grown apples, but was shocked to find that there's not much of a difference. The amounts of $CO_2$ produced for individual foods vary wildly and are very difficult to predict – labelling would help the consumer make an informed choice.

So where does the engineering come in? This isn't purely an exercise in social engineering. More transparency would force companies to re-evaluate their emissions, improving the efficiency in processes such as refrigeration, transportation, harvesting and packaging. If companies were to concentrate their engineering resources in these areas, huge advances could be made.

In terms of practicalities, I would propose that the Carbon Trust would be the ideal body to oversee the labelling. They already provide this service for businesses that choose to certify with them. A thorough engineering approach to the labelling would involve writing standards to calculate the emissions in a fair and accurate manner.

The benefits to society reach far beyond the consumers who would be seeing these labels. Those in the world who contribute most to climate change are often those who feel its effects least. Unless action is taken, problems will only worsen with the rising population and more of the world adopting the meat-rich western diet. Food waste and the environmental impact of our diets are issues of truly global significance.

I feel that food environmentalism is currently at a turning point: veganism is becoming mainstream and trendy in the younger generation thanks to a multitude of celebrities that now follow the diet. Carbon emissions labelling would allow the message of our food's impact on the planet to reach a wider audience. The present, when the issue is already on the horizon of the public consciousness, would be a perfect time to implement this solution.

My vision stretches further than mere labels on packaging. Before you know it, you might be finding your '$CO_2$ total' on the receipt of your weekly shop. Who knows, it might even be a step towards a carbon tax on food. Meat and dairy being some of the biggest contributors to obesity as well as emissions, this could well save lives in more ways than one.

Would carbon emissions labelling increase the cost to the consumer? Quite probably, by a small amount. But seeing as the highest proportion of food wastage in the supply chain is in households, it seems like a worthwhile sacrifice for the sake of our shared planet and future.