

food ethics

The magazine of the Food Ethics Council

Waste Dishing the dirt

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Paul Bettison | Jane Bickerstaffe | Michael Braungart | Jane Carlton-Smith | Terry Clayton | Jon Cossham | Charlotte De Fraiture | Sue Dibb | Michele Field | Julia Hailes | Charlotte Henderson | Jane Hersey | Julie Hill | Peter Jones | Timothy Jones | Tony Lowe | Terri O'Neale | Andrew Opie | Achim Steiner | Jilly Stephens | Tristram Stuart | Richard Taylor | Annabel Townsend | David Wilson | Leslie Wilson



Introduction

- 04 The bread we waste | David and Leslie Wilson
- 08 Perishing possessions | Tristram Stuart

Research

- 11 America's relationship with food and its waste | Timothy Jones
- 12 Spilling the beans | Annabel Townsend

The big question

- 13 What's in your bin?
Andrew Opie | Terri O'Neale | Sue Dibb
Jon Cossham | Paul Bettison | Jane Bickerstaffe
Julia Hailes | Richard Taylor | Jilly Stephens | Peter Jones

Technology

- 18 Re-packaging the recycling debate | Julie Hill
- 19 Tackling food and packaging waste | Charlotte Henderson
- 21 Cradle to cradle | Michele Field and Michael Braungart

Community

- 23 One planet living | Jane Hersey
- 25 No good food should be wasted | Tony Lowe

Policy

- 26 Averting the environmental food crisis | Achim Steiner
- 27 Wasted food, lost water | Charlotte De Fraiture and Terry Clayton

Regular features

- 03 From the editor
- 30 Book reviews
- 31 Restaurant review | Jane Carlton-Smith



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The Food Ethics Council challenges government, business and the public to tackle ethical issues in food and farming, providing research, analysis and tools to help. The views of contributors to this magazine are not necessarily those of the Food Ethics Council or its members.

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From the editor

What's wrong with waste?

Tom MacMillan

Wasting food upsets me. Composting that mouldy carrot feels like burying a neglected pet. Yet I do waste food and, unless I'm an anomaly, research by the UK's Waste & Resources Action Programme (WRAP) suggests I actually squander far more than I think I do.¹

Government's current war on waste, including WRAP's 'Love Food, Hate Waste' campaign and Hilary Benn's attack on 'sell by' dates, focuses on resource efficiency. Waste hurts your wallet and hurts the planet. This edition abounds with numbers to underline this point: wasted food costs UK households hundreds of pounds a year; around seven million tonnes of food end up in landfill in the UK annually; and producing and distributing edible food that goes to waste may account for as much as 5% of total UK greenhouse gas emissions. This is hardly just a British problem either: Timothy Jones (p.11) reports that US households throw away nearly a quarter of fruit and vegetables, and 13% of meat.

However, there are other reasons, in addition to this utilitarian logic, that society frowns on waste in general and on food waste in particular. For one, waste is deeply unfair. Tristram Stuart (pp.8-10) estimates that avoidable waste of cereal-based foods in Britain and the USA alone would be enough to lift 224 million people out of hunger. Producing food for landfill has a tragic opportunity cost.

I expect I am not alone, though, in finding that my own unease with waste isn't fully explained by these numbers. The fact is, wasting food just feels wrong. Whether this is moral intuition or simply habit is an open question. After all, wastefulness and the waste itself can each provoke disgust, and the taboos around both endlessly engross anthropologists.

So, wasting food is inefficient and unfair, and it seems plain wrong. Cutting waste clearly helps with the last of these three problems, but what about the other two? If we waste less food, will that actually benefit other people or the environment?

The answer depends on what we do with food waste, and on what else we would do with the labour, land, water and energy that we save along the supply chain.

The best scenario is that the productive resources we save get diverted towards feeding hungry people. The trouble is, this isn't guaranteed. In fact, we know that hunger and malnutrition can exist when food is readily available. Absolute and relative poverty, rather than food prices per se, are the key determinants of household food security.

Far more likely, all else being equal, is that resources we save by cutting food waste will be put to producing and consuming other things. These might include growing more resource-intensive and expensive foods, producing bioenergy or textiles, or making industrial products. Is wasted food necessarily a worse use of resources? As long as the 'waste' doesn't go to landfill – if it is used for compost and anaerobic

If we waste less food, will that actually benefit other people or the environment?

digestion, or goes to food banks like the UK's FareShare or New York's City Harvest – you could argue it is better than producing goods to meet new, yet to be invented, consumer demands.

A third scenario is that, where resources are being used unsustainably, they drop out of production altogether – we start to live within our economic and ecological means. Cutting food waste alone won't make this happen. It depends on also constraining the ravenous scavenge for resources and drive to consume that economic growth impels. At the very least, that requires that we manage resource use more tightly, for instance through more effective pollution controls, emissions pricing and production

standards. But, even then, the risk is this exacerbates hunger, since many of the world's least food secure people depend on farming for a livelihood.

So, food waste feels morally wrong yet, to make good on all the aspirations we attach to waste reduction – to be fairer and more efficient – we need to do a stack of other things besides planning meals carefully and cleaning our plates.

First, we can only claim that reducing food waste helps food security if it goes hand-in-hand with a massive boost to international efforts to tackle poverty and hunger. Rich countries including the UK have repeatedly fudged commitments to meet these Millennium Development Goals.

Second, reducing food waste will only make a lasting dent in our environmental footprint if, in the words of the UK Sustainable Development Commission, we aim for 'prosperity without growth'. Our structural commitment to economic growth means that, to date, increases in per capita consumption have outstripped savings from greater efficiency. Unless we confront the causes of our throwaway society, throwing away less food will not make our lifestyles more sustainable.

Where does this leave me and my rotten carrots? I certainly need to be sure they won't end up in landfill. But am I obliged to reduce my waste in the hope that this will prompt governments and businesses to do their bit? And if they don't, does that mean I'm just wasting my time instead of my food? These are not trivial or frivolous concerns – on the contrary, they highlight the profound difficulties in understanding whether our moral intuitions about food waste provide a reliable basis for ethical action. The contributions to this edition should help us to decide. ■

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The bread we waste

The past, present and future for the world's wasted food



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Louis Paulian, talking to Parisian chiffonniers (rag-pickers) in the early 1880s, recorded the ways they dealt with bread scraps: "If they're clean," the chiffonniers told him, "we eat them, and if they're too dirty, we make the bourgeois eat them... We never waste anything." In Parisian households of the time, the cooks usually gave clean bread straight to the chiffonniers, but they threw the dirty bread in the bin. Clean bread went home and was dipped in soup to soften it and make it fit to eat – this is hard stale baguette we're talking about. If there was a surplus of good quality waste bread, it was sold on, via a middleman, mainly to feed the children of poor Parisian tradespeople who were being reared by women in the suburbs.

Soiled bread had plenty of uses; the best was fed to pigs, rabbits and poultry, and the chiffonniers' horses, if they had them. Bread that was so disgustingly filthy that the animals would refuse to eat it would be roasted in an oven and then sieved. The coarse crumbs that wouldn't go through the sieve were sold to restaurateurs in the Quartier Latin for breadcrumbs. These restaurants were used by students, who bought their dinner for 90 centimes, and neither knew nor (Paulian suggests) cared that their hams and cutlets were coated with bread that had been rejected by animals. The burnt powder that was the residue of this process was made into tooth-cleaning powder and 'chicory' which was sold in grocers' shops. Thus the lower echelons of the bourgeoisie had their leavings returned to them, and were made to pay for it.

The evolution of solid waste management

Before the industrial revolution, resources were relatively scarce. So household goods were repaired and reused, and food and garden waste were used as animal feed or to make compost for use on the land. As cities grew with industrialisation and people worked long hours to earn a living, they no longer had the time or the ability to do this themselves: large numbers of people found an economic niche as 'street buyers' or 'rag-pickers', collecting and using or selling materials which would otherwise have been, or had already been discarded, as waste. Or even before the householder thought they were superfluous: Henry Mayhew, writing in 1851, describes how 'women, often wearing suspiciously large cloaks and carrying baskets', and often in the early morning, would call at houses where there was a cook and buy dripping by the lump. The cook thought she was entitled to this perk; this view was only sometimes shared by her employer, though most 'quietly made up their minds to submit to it'. The dripping was then sold to poor people as a substitute for butter.

But not everything had a ready value – particularly what we now call 'residual wastes' accumulated in the streets. This was made up of household wastes, human and animal excrement, soil and stagnant water, combined in a foul-smelling mud. Many attempts were made over the centuries to clean up, driven both by a practical concern to

keep the streets clear of obstruction, and by the disgusting smell. 'Rakers' were periodically employed by English towns to remove waste from the streets; they took out anything saleable and often gave or sold the residue to farmers (depending on how rich it was in vegetable wastes and more particularly horse manure from the streets). However, most of these initiatives did not last; the poor were more concerned with where their next meal would come from, and the rich objected to paying to clean up for the poor.

At the end of the 18th century, quantities of residual household waste in London were increasing fast. But the rapid growth of the city also meant that coal ash (from domestic heating and cooking) was in demand, both for brick making, as local clay was in short supply, and as a soil conditioner, to help bring more land into production for corn or vegetables. So the London Parishes began to let contracts, effectively granting an exclusive franchise to a private contractor to collect the 'dust' and sweep the streets in their area. A network of 'dust-yards' sprang up across London, where a small army of workers sifted through the waste and produced various fractions for sale. One of these was 'soft-ware', i.e. the kitchen scraps and street sweepings. Mayhew also describes pigs and chickens being kept on the dust-yards, foraging among the waste.

The dust trade in London peaked around the 1830s, and the parishes began to have to pay for their annual contracts. This coincided with cholera arriving in England from India, which led eventually to the first clear linkages between such infectious diseases and poor sanitation conditions, and to a series of Public Health Acts. By 1875, householders were required to keep their waste in a 'movable receptacle'; local authorities were responsible for emptying this receptacle at least once a week.

The bread we waste

Between 1850-1900, municipal authorities became stronger, and generally set up their own 'public cleansing' departments. As time went on, these formal waste collection services gradually 'squeezed out' the informal recycling sector, though war did temporarily bring recycling back to prominence in the 20th century. In the second world war, bins were placed on street corners for food wastes, which was used as pig-swill on municipal farms, or boiled up as 'Tottenham puddings' which were sent by rail to pig farming areas.

The focus of solid waste management remained on waste collection, getting waste 'out from under foot', for a century – right up to the emergence of the environmental movement in the 1960s. Successive legislation banned open dumps and gradually ramped up environmental standards on landfill gas and leachate and on air pollution from incinerators.

Ironically, this increase in environmental control has coincided with a rapid growth in the amount of waste. Every person in the UK generated on average 300 kg of household wastes in 1980, but more than 500 kg in 2005. This explosion in quantities may be attributed to increasing living standards, and also to the rise of consumer packaging and disposable products.

Are we wasting more food?

It is difficult to compare the amount of food waste today with that in the past, because we don't have the historical data. We can get an impression of the changes with increased living standards by comparing the food content of municipal solid waste in cities in rich and poor countries today. The lower the income of a city, the lower the quantity of municipal solid waste that is generated, but the higher is the proportion of putrescible and vegetable (i.e. mainly food) waste. Data are notoriously poor and unreliable, but figures for Asia suggest that a low-income city might generate 60-90 kg food waste per person per year, compared to perhaps 90-120kg in a middle-income city and (according to WRAP's figures) around 120 kg in the UK.

This seems to suggest that we do waste more food as we get richer, although not by a huge margin. But these figures can be misleading: most of the food wasted in low- and middle-income cities is inedible (e.g. coconut husks in season in Sri Lanka or water melon rinds in China), with a proportion due to spoilage and poor storage conditions. In the West today, less inedible food actually reaches our homes. Refrigeration has largely eliminated early spoilage. Nevertheless, according to WRAP's excellent work, we are throwing away a third of all the food we buy, and at least



The bread we waste

half of that is food that could have been eaten, if we had only managed it better.

Even this underestimates the extent of our profligacy. The municipal waste data for low- and middle- income cities tends to include markets, shops, cooked food stalls and restaurants, as well as household waste; whereas the UK data includes only the proportion of commercial waste collected by local authorities, and so excludes most distribution centres, supermarkets and restaurants. Adding in food waste elsewhere in the supply chain would greatly increase the WRAP figures for food that is produced and distributed, but never eaten.

Changing attitudes

In the past, the poor didn't waste food; they couldn't afford to. This at least is in sharp contrast to the WRAP survey figures that show that poor families waste just as much food as well-off ones do nowadays. Poor people in the past were hungrier, and if they grew food for themselves, knew the value of it. Where they did have waste food, it would often be fed to animals – even in the penurious rural households Flora Thompson describes in her memoir 'Lark Rise' there was pot-liquor to feed to the pig. The lower classes in towns also kept pigs – sometimes in houses – and also chickens, which were ready receptacles for any food waste.

Lower middle-class households hashed up left-over food; the better-off expected their servants to eat left-overs. Ladies were expected to waste food, though. In her novel based on the real life of her father's old nurse, Gran-Nannie, Noel Streatfeild describes how young girls were instructed to leave a little food on their plates for 'Mr Manners.' This was partly to show that, as ladies, they were immune to the carnal temptation of food, probably also because slim figures had already become fashionable. However, when the First World War broke out and food became scarce, Grand-Nannie had to tell her charges that from now on they must clear the plate. This message clearly needed to be given all over again when the Second World War started: 'A clear plate means a clear conscience' a wartime poster exhorted Britons - 'Don't take more than you can eat.' There is some evidence that these attitudes hang on in public consciousness; WRAP's study found that older people waste less food.

It seems that the overall affluence of today's Western society, and the way in which food is sold and eaten, makes its citizens, rich and poor, behave like the rich of the past. Only nowadays there is hardly anyone (human or animal) to consume the leftovers.

Our food waste is a global issue

Does it matter that we are wasting more food, and in particular more food that could have been eaten? Clearly it's good if people no longer need to eat other people's leavings, but food wasted represents money lost to a household: between £250-£400 per year according to WRAP.

Another part of the answer is that, if the food waste goes to landfill, it will generate methane, which is a powerful greenhouse gas. Solid waste management is estimated by the Intergovernmental Panel on Climate Change (IPCC) to contribute around 1.5% to global emissions (measured as carbon dioxide equivalent); one study suggests that the quantities emitted could quadruple by 2050 if developing countries collect and landfill all of their wastes.

This contribution seems relatively small. Nevertheless, the waste industry has already acted to mitigate the problem, with the EU setting stringent targets to divert wastes from landfill. The UK has over the last 10 years increased recycling and composting rates for municipal solid wastes from around 6% to more than 30%, with further increases to come. More local authorities are rolling out separate collections systems for food waste, which will go to composting or

anaerobic digestion (which produces methane for use as an energy source and a compost-like product). Supermarkets similarly are developing systems that will allow them to compost or digest pre-packaged fruit and vegetables that have gone beyond their sell-by date.

Mitigation at the 'end-of-the-pipe' by diverting waste from landfill, and recycling organic nutrients back to the land, is a necessary part of any solution, but it actually misses the main point. Huge amounts of energy go into producing the food we eat. Vast quantities of grain are grown to feed our cows, pigs and chickens. Fruit and vegetables are available in our supermarkets all the year round.

The carbon footprint of an organic tomato grown outdoors in your own garden in the summer is relatively low. But that for a Dutch tomato grown in winter in a heated greenhouse with the use of fertilisers, pesticides and irrigation, is huge, even before it is refrigerated, transported, stored and sold. The food we eat is responsible for around 20% the UK's entire carbon footprint. So if around half of the food produced is never used (increasing the WRAP figure of a third of the food we buy, to allow for wastage further up the distribution chain), and half of that could have been eaten, then we are squandering 5% of our total carbon footprint on food

The overall affluence of today's Western society makes its citizens, rich and poor, behave like the rich of the past

The bread we waste



produced only to be thrown away. This completely dwarfs the carbon savings we can potentially make by diverting some of this food waste from landfill to composting or anaerobic digestion.

Even this understates the ethical issues. As Gandhi said: 'There is a sufficiency in the world for man's need but not for man's greed'. We are wasting the world's resources to grow food that we don't even eat, when millions in developing countries are starving.

What solutions can we find? The larger ethical issues of the distribution of the world's resources, or the nature of the globalised free-market economy, or the power of the global agri-industry, will no doubt be picked up by others.

From a waste management perspective, we have made a start, both with the '3Rs' – reduce, reuse, recycle – and with behaviour change. WRAP's Love Food, Hate Waste campaign is making a difference. Supermarkets are beginning to offer smaller packs of food, or offering promotions on multiple purchases of complementary items rather than the ubiquitous 'buy one and get one free' (the acronym, BOGOF, seems peculiarly apt). Charities such as FareShare redistribute surplus food from the food industry to community organizations. And composting is once again on the increase.

But, whatever your perspective, there is still much work to be done. ■

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Perishing possessions

Why eating up your food really does make a difference



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It is now abundantly clear that fluctuations in consumption in rich countries affect the availability of food globally and this impacts directly on poor people's ability to buy enough food to survive.

In the seventeenth century, the philosopher John Locke argued that if someone took more food than they needed and let it go to waste, "he took more than his share, and robbed others." If, on the other hand, he consumed, traded, or even gave away his surplus food "he did no injury; he wasted not the common stock; destroyed no part of the portion of goods that belonged to others, so long as nothing perished uselessly in his hands." How do modern wealthy nations stand up to Locke's judgements, and do his moral paradigms hold any lessons for us today?

In a globalised food supply chain, the people who depend on the same 'common stock' of resources are no longer necessarily our neighbours, nor even our compatriots. They may live thousands of miles away, but many people in Asia and Africa still depend on the global marketplace for their food. How do we answer for the fact that most countries in Europe and North America waste up to half of their total food supplies between the plough and the plate?

Whether it is fresh fruit and vegetables rejected by supermarkets for failing to meet arbitrary cosmetic standards, or manufacturers forced to discard millions of slices of good fresh bread because supermarkets don't like their sandwiches to be made from the outer slices of a loaf, or whether it is the waste we all daily witness in our own homes – all of this represents land, water and other resources that could be put to better use than filling rubbish tips with food.

The connection between food profligacy in rich countries and food poverty elsewhere in the world is neither simple nor direct, but it is nevertheless real. Obviously, the solution is not for rich countries to send old tomatoes or stale bread over to poor countries after saving them from the rubbish bin. This spurious connection assumes that the food in rich people's homes or overstocked supermarkets had no other potential destiny than ending up in rich countries in the first place.

Cynics will argue that there is no connection between food being wasted in rich countries and the lack of food on the other side of the world. Their argument may have been stronger in the past, when famines were sometimes more to do with local conditions – such as war or natural disasters – than global shortages. But there has long been a connection, and the food crisis of 2007–8, largely caused by global shortages of cereals, has made this even more evident.



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The case for this is most easily demonstrated by cereals – principally wheat, rice and maize – which have global prices determining the cost of food in the markets of Africa and Asia just as they do on the shopping aisles of the United States and Europe. The amount of cereals that rich countries import and export depends on how much is used within those countries – and how much is thrown away. If Western countries divert millions of tonnes of cereals into their rubbish bins, there will be less available on the world market. If they stopped doing so, there would be more and it would be more likely to be affordable.

Since food supply has become a global phenomenon, and particularly when demand outstrips supply, putting food in the bin really is equivalent to taking it off the world market and out of the mouths of the starving.

Wasting food also uses up the world's limited available agricultural land. If rich countries wasted less this could liberate agricultural land for other uses – and this applies even for fresh produce grown and purchased within individual nations. If that food wasn't being bought and wasted, the land and other resources could be used to grow something else, including food such as cereals that could contribute to much-needed global supplies.

There are legitimate objections to this argument – for example, that rich countries' demand for food can stimulate production and contribute to the economies of poor nations, and therefore throwing food away merely increases demand which raises some farmers' revenues. It is also true that in some circumstances growing surplus can be a necessary and desirable measure to prevent food shortages.

But creating surplus food involves a trade-off in terms of land use, resource depletion and stretching supplies, so therefore when ecological or production limits are reached, the costs of waste outweigh the potential benefits. It is true, too, that if rich countries stopped wasting so much, the food that would be liberated might merely be bought by other relatively affluent people, for example to fatten more livestock, rather than being eaten by the poorest families. But overall, pressure on world food supplies would decrease, helping to stabilise prices and improving the condition of the vast majority of poor people who depend on these markets for their food.

Hunger and malnutrition are not exclusively foreign concerns either; millions in the developed world also do not have enough to eat. In Britain alone, four million people are unable to access a decent diet. In the United States around 35 million live in households that do not have secure access to food and, in the European Union, an estimated 43 million are at risk of food poverty. This situation persists even while supermarkets throw away millions of tonnes of quality food. Here one

potential solution is for surplus food to be given to organisations such as FareShare in the UK or Feeding America in the US, and redistributed to people who need it while it is still fresh and good to eat.

So in terms of taking food from the mouths of the hungry, how significant is the food wasted in rich countries? One way of looking at this is to calculate the nutritional value of the food being wasted. It is difficult to imagine a million tonnes of food, but converting that measurement into the number of people that could have been fed on it makes it more comprehensible and the value of that food more vivid. It can even help to provide a clearer idea of how many people the world would really be able to feed if people cut down on waste.

According to the Food and Agriculture Organisation of the United Nations (FAO), the average calorific deficit for malnourished people in the developing is 250 kcal per person per day – a level of undernourishment that is called the 'depth of hunger.' Supplying an average undernourished person with an extra 250 kcal a day above what they are getting already would allow them to attain a minimum acceptable body weight, and perform light activity. Malnourishment causes children to be stunted and it retards brain development; it damages the immune system and sometimes leads to death by starvation: 250 kcal extra a day on average would be enough to prevent all this.

In terms of taking food from the mouths of the hungry, how significant is the food wasted in rich countries?

The detailed studies on food waste conducted in Britain and America allow us to calculate the nutritional content of wasted food with some precision. British consumers and American retailers, food

services and householders throw away enough grain-based foods, mainly in the form of bread, to alleviate the hunger of more than 224 million people – that is, it could have supplied them with that extra 250 kcal a day they need to avoid malnourishment (and that still does not include the industrial waste of food in as-yet unmeasured links in the supply chain). If you include arable crops such as wheat, maize and soy used to produce the meat and dairy products that are thrown away, this comes to enough food to have alleviated the hunger of 1.5 billion people – more than all the malnourished people in the world. That grain – if we had not outbid the poor for it – could have stayed on the world market; people could have bought it, and eaten it.

Using a completely different set of production and consumption data from the FAO, it is possible to calculate approximately how much food could be saved if all nations in the world reduced waste and unnecessary surplus to the extent that no country supplied its population with more than 130 per cent of the population's nutritional needs (as opposed to 200 per cent in the case of the US today and

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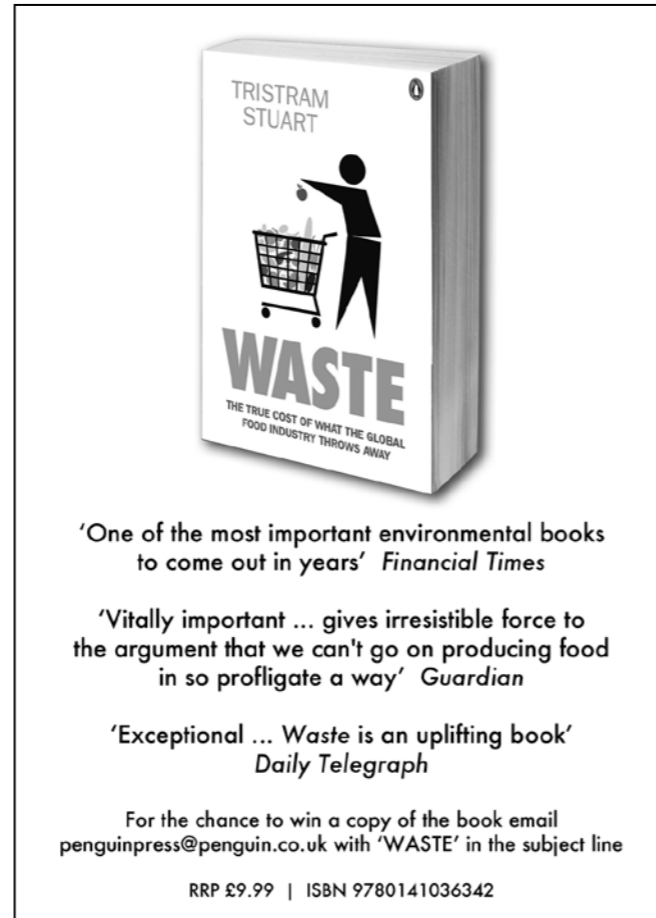
slightly less for most European countries). The details of this calculation are laid out more fully in my book, 'Waste: Uncovering the Global Food Scandal', but the overall total shows that 33 per cent of global food supplies could be saved, or enough food to provide the entire nutritional requirements of an extra 3 billion people.

Even these staggering totals do not include the savings that could be made if Westerners ate a smaller proportion of cereal-fed livestock products in their diet which would liberate grains that are inefficiently fed to animals rather than people, and it does not include the potential savings from agricultural products currently wasted in rich nations before they enter the human food supply chain, such as potatoes rejected on cosmetic grounds, nor the diversion of food crops into other non-food uses, nor the millions of tonnes of fish discarded by fishing fleets each year, nor the massive savings that could be made if Europe used its gargantuan piles of food waste to fatten pigs and chickens, rather than, as at present, outlawing this ancient recycling process under misguided animal by-products legislation.

It seems that the affluent world is doing on a global scale what Locke warned against in seventeenth-century England. We sequester the land and other common resources of the

world to grow food that we end up wasting. According to Locke, this annuls our right to possess both the land and the food grown on it.

It is understandable that we have not yet learnt to appreciate how our everyday actions affect people on the other side of the planet. This kind of global consciousness is relatively new, and societies always take time to absorb big ideas, particularly when they are uncomfortable ones. It is too easy to resort to condemnation and outrage. Rather than feeling guilty, we should feel empowered by the sense of responsibility. It is a relief, in many ways, that we can enhance the lives of the world's hungry by doing something as easy as buying only the food we are going to eat, and eating whatever we buy. ■



America's relationship with food and its waste

**Timothy Jones**

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The USDA Food Loss Study was conducted to gain quantitative measures and qualitative perceptions of food loss in the American food system.

The study incorporated the contemporary archaeological techniques of actual measurement of losses along with ethnographic and participant observation as new methodological approaches.

Why are these methods different and important? There has been much research conducted by The Contemporary Archaeology Project, The Garbage Project and others showing that information derived from the measurement of modern materials can provide different information than that derived from interview, questionnaires and observation. I have conducted in depth research that has shown people report far wider varieties and types of behaviour than is actually measured archaeologically. Their perceptions influence their reported behaviour more than their actual behaviour. These patterns are particularly true for repetitive everyday behaviours including food use and its waste.

People simply do not think about food itself, let alone its waste, other than the fact that when food is eaten it rids us of hunger pains.

Americans perceive food to be cheap and plentiful. It is arguable whether food is plentiful or cheap. According to the Bureau of Labor Statistics Consumer Expenditure, in 2002, the typical household spent 11% of their expenditures on food.

American households allow 14% of the food they purchase to end up in their garbage. This costs a household of four nearly \$1,000 a year and deprives the American economy of \$54 billion annually. Americans are unaware of the myriad ways they lose food. In fact, when most households are asked about how much food they lose the response is none to very little. During household interviews it was not unusual to see household members throwing leftover food in the trash while simultaneously stating that they do not waste food.

Nearly a quarter of fruits and vegetables, 13% of meat and 16% of grains Americans buy are trashed mainly because they "go bad." When a food "goes bad" is quite subjective. Many households throw leftovers out at the end of a meal believing that the food cannot "safely" be stored. This is particularly true for younger households and households with children. Food storage such as freezing and airtight containers is a withering American practice.

Americans also misjudge their future food use, basing it on their perceptions of how they should eat rather than how they actually eat. This means that they end up purchasing

far more vegetables and fruit than they will eat.

They believe they live a healthy lifestyle so when they go to the store they purchase lots of nutritious fruits and vegetables expecting to consume them throughout the week. Every night they come home from a long workday

exhausted and shove a frozen dinner into the microwave so they can eat before they go to bed. When Saturday comes around and they have the time and energy to cook, the vegetables in the refrigerator have turned to mush.

Fourteen percent of household food loss consists of packaged edible food that has not been removed from its original packaging and was not out of date. Much of this food loss is due to misfires in American food purchasing behaviour. People purchase new products and never get around to using them since we are usually creatures of habit. People also purchase more product than they will use in order to "save money" on large quantity purchases. Every so often Americans clean out their cupboards and throw out these perfectly good foods.

It was not unusual to see household members throwing leftover food in the trash while simultaneously stating that they do not waste food

Still, there is a far more basic issue that leads to food loss. People have simply lost touch with food and how it functions in the life cycle. They are not even aware of where it comes from, let alone how to produce it. Western society is undergoing a loss of cultural knowledge.

Food production, once the chief occupation of Americans, is now the domain of less than 2% of them. The United States currently excels at producing food, but just a few major shocks to key points in our food system could have catastrophic results. There are not enough people knowledgeable about growing food to resurrect the system of "victory gardens" that supplied sorely needed fresh vegetables in the early years of World War II. ■

Spilling the beans

Waste in the speciality coffee industry



Waste in the coffee industry is often difficult to define. Coffee, like any other foodstuff, is organic and therefore biodegradable, so in a sense there is little to no physical waste from this industry that has any lasting impact on the land.

However, coffee can be wasted in less direct ways, as can by-products from the industry. Fieldwork on coffee plantations in Nicaragua and Costa Rica during the most recent harvest season has shown that the higher quality the coffee, the more is wasted during its production. Speciality coffee is, by definition, exclusive, and what is excluded (the lower quality coffee) can be wasted. 'Speciality' or 'gourmet' coffees still only account for 18% of the world coffee markets (Mintel 2008) and so the amount of waste generated is not high. However, as speciality coffee commands considerably higher prices, it is in the interest of the farmers to produce this higher quality but more wasteful product.

Coffee waste then, is directly linked to quality. Speciality coffee is defined as coffee which achieves over 80 points on the Speciality Coffee Association of America (SCAA)'s cupping scale. This grading is evaluated by trained 'cuppers' or expert sensory assessors, who are usually employed by the companies looking to buy the coffee. Any coffee crop that fails to reach these quality standards required by the First World buyers and consumers can be counted as waste.

Such is the global coffee market that, if it can be sold at all, then all but the highest quality is sold at very low prices. For example, around a fifth of coffee in Nicaragua can only be sold nationally, or to instant (soluble) coffee companies, as it cannot be exported if it does not meet the SCAA's standards. Instant coffee companies often pay 'unsustainable' prices – that is, below the cost of production.

Yet all these coffee crops require the same resources to produce and the quality of it can be affected by anything from too much rain, damage from pests and insects to delays in transportation. Low quality is not always the fault of the farmer: coffee is as variable and unpredictable as any other crop, and some level of defective coffee is unavoidable. In this sense, the time, resources (water, electricity, fertilizer, transport costs) labour, skills and actual coffee beans used to produce this low quality, are all wasted, because the farmers cannot get the returns they need for their investments.

The other major source of waste in this industry is waste water. After depulping (removing the fruit) and fermentation, coffee beans have to be washed in very clean water to remove the 'agua de miel' – the mucilage which still surrounds the bean. This process requires an enormous

volume of water at quite high pressure. After washing, this water becomes cloudy and highly acidic with the coffee juices. Although it is possible to purify this water and recycle it, this is an expensive process and the majority of farms in Nicaragua do not have the requisite facilities. Instead, it is left to drain away into the land, contaminating the water table and damaging the nutrient content of the soil (which again, affects the quality of the following years' crop). Costa Rica and Nicaragua have passed laws to protect against this contamination, but often these cannot be implemented due to lack of resources; the farmers cannot purify water themselves, and the government cannot, or will not, subsidise the equipment needed for them to do so.

Some by-products of coffee production can be reused or recycled and sold off to other industries. As coffee is an organic product, unused fruit and beans can always be composted and the compost is a useful and valuable resource for farmers seeking to fertilise the following year's crop. Water can be purified, aguas de miel can be fermented and used to form biogas for fuel, and oil can actually be extracted from waste beans and used coffee grounds for use in biodiesel production if such facilities exist to process it. Parchment from dried

coffee beans can be used to make paper. Extremely low quality coffee can be sold to companies who make food additives and flavourings, and even the caffeine powder extracted during the decaffeination process can be sold to energy drinks companies or the pharmaceutical industry. As such, it is possible to produce very little or no tangible, physical waste from the coffee industry.

But here's the rub – where the facilities do not exist to process these useful and economically viable by-products, where the will and money to invest in those facilities are not in evidence, and whenever recycling schemes are not adhered to for whatever reason, then waste in the coffee industry is a real – and entirely avoidable – problem. ■

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Some by-products of coffee production can be reused or recycled and sold off to other industries

the big question What's in your bin?

Whether it is banana skins, potato peelings or that last mouthful of dinner you couldn't quite clear from the plate, food waste is costing families and council taxpayers the earth.

In the hectic whirlwind of modern life, it is hard to know how much food to buy, to plan meals and to cut back on waste. Of course, we should still try. Indeed, efforts abound to help families make their weekly shop go further. Inevitably some food will always end up in the bin - but does it have to rot in the ground?

Many councils are now giving residents a separate bin for their food waste. Leftovers are being turned into fertiliser, or gas to generate electricity. In some areas, in-vessel composting and anaerobic digestion are playing a key role in cutting council spending on landfill tax and reducing methane emissions.

This role could be far bigger though. A lack of infrastructure is holding back the drive to make getting rid of food waste cheaper and greener. Councils do not want to collect leftovers without somewhere to send them, but nobody wants to build the places to send food waste until it is being collected. Town halls will continue working with investors and the private sector to break this impasse.

A bigger task is to get the public's backing for these technologies. There is still much misunderstanding about how safe and clean anaerobic digestion and in-vessel composting now are. Nobody likes the idea of rubbish being sent to their neighbourhood but local leaders need to redouble their efforts to convince people that turning food waste into something useful is a clean, efficient and, above all, frugal way of dealing with the food we leave on our plates.



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For the past year, our 'average' family of four has been striving valiantly to decrease the amount in our bin. We have employed such strategies as increasing recycling, growing our own vegetables and purchasing a wormery through the council's subsidised programme. We have managed to reduce the amount of waste we send to the landfill to just a single thirteen gallon bin bag. But there we have stuck.

I have read all the literature about the three R's: reduce, re-use and recycle. We do amazingly well at re-using old furniture, clothes and even food. My blog extols the virtues of Freecycle, charity shops and leftovers. But when it comes to reducing, the battle is tough.

One of the biggest contributors to our bin bag is packaging. Council literature suggested that purchasing fruits and vegetables loose was cheaper and reduced the amount of plastic that makes its way into the bin, so I tried it one week. I used a bag for life to hold all my loose produce until we reached the check out. I found that it actually added a couple of pounds to our weekly shopping bill, which would have been over one hundred pounds in a year, the equivalent to a gas bill.

The most frustrating part of this battle is that essentially it is beyond our control. Why does a four pack of baked beans, which saves our family over twenty pence, require an extra layer of plastic wrap that is not even recyclable? Could the store not just as easily tag the item forty pence for one or four for one-pound forty? Disappointingly, it seems the 'average' consumer is at the mercy of the stores and producers.



Sue Dibb

Writing in a personal capacity, Sue is the Sustainable Development Commission's team leader on sustainable consumption and business and the Chair of the Brighton and Hove Food Partnership.

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What's in your bin?

'Eat up; think of the starving children in Africa!' This was the moral mealtime message drilled into my in childhood memory by parents who themselves had endured wartime rationing. Today, I'm more concerned my kids don't overeat on the 'wrong' foods, than ensuring they eat every last morsel. But I'm still concerned about waste in the food system.

It's a staggering statistic that we throw away a third of our food. Around half of that is peelings and other inedible waste – but it is still too much. WRAP's Love Food Hate Waste campaign is successfully raising awareness but more needs to be done to reduce unnecessary waste and make use of that which is unavoidable.

My vegetable patch is the beneficiary of my kitchen compost – but that only disposes of the fruit and veg peelings. My two chickens happily eat unused bread, rice and pasta and we get delicious eggs in return. I thought the answer to recycling the rest of our kitchen waste was a kit that promised to compost cooked foods, meat leftovers, fish bones etc. by sprinkling on a magic mixture. But the unsuccessful result was a sludgy undigested mess that ended up in the dustbin.

Anaerobic digestion provides the technology to turn food waste into biogas, a renewable energy source for heat, power, transport and biofertiliser. It keeps organic waste out of landfill, reducing greenhouse gas emissions. It's time every local authority collected household food waste – where I live in Brighton and Hove, despite our green credentials, we don't yet have this service. Anaerobic digestion is common in other European countries, but here we're still largely trialling this technology. With statutory commitments to reduce the UK's GHG emissions by 34% by 2020, faster action on food waste must be a priority for government, local authorities, businesses and individual householders.

What's in your bin?

"Use-by dates and their absurd companions 'sell-by' and 'best before'... are just a marketing scam, intended to persuade us to throw away perfectly good food so we have to buy more."

Those are the dangerous words of TV chef Clarissa Dickson-Wright.

'Use-by' dates are required by European law and vital to preventing illness or even death from eating unsafe food.

Food and Environment Secretary Hilary Benn doesn't appear to be suggesting scrapping those, but his speech at the Packaging Strategy launch was widely interpreted as meaning a possible end for 'best-before', 'sell-by' or 'display-until'.

He said, "I want to improve the labels on our food so that... we know exactly how long it's safe to eat."

Certainly, some customers aren't clear about what the different dates mean but getting rid of them won't reduce food waste. Customer education will.

In fact the current regime makes it absolutely clear when food's safe to eat. That's what a 'use-by' date is for and the others also have important jobs to do.

The 'best before' date is generally about food quality. 'Display-until' dates help store staff to manage stocks.

Removing those two could actually increase waste. It would be harder for stores to ensure food that's no longer top quality (but is still perfectly safe) isn't out on sale.

Retailers are already working with Government to improve understanding and to help customers make better decisions about buying, storing and using food at home. That's where the solution lies.



Andrew Opie

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My household doesn't generate much rubbish. The wheelie bin outside only gets emptied every 6 weeks or so. It usually contains wood ash from the stove, margarine tubs and yoghurt pots, plastic film (if it's got food on it) and occasionally broken toys or other things I can't recycle or reuse.

Ever since I was small I've been fascinated by the decomposition process of organic matter. As a child I'd line up jam jars of organic matter – bread, meat, cheese – and watch over the weeks as the bacteria and fungi developed. As I've got older that fascination has, if anything, become even stronger. I've become more aware of our planet's unique existence in this universe, and our place within the Earth's ecosystem. I want to help ensure we'll still be here for generations to come, and closing the loop is one way I can do that.

When I moved to this house in 2001, I started a compost heap – now I've got 34! I teach people to compost, whatever their circumstances. I'm on a mission to reconnect people with their food, and show them how easy it is to turn it into useful material. People have lost the ability to use their judgement about when food is off, and when it's still ok to eat.

Some might say that composting a few crumbs of bread is a drop in the ocean. I'd reply that every drop counts.



John Cossham

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What's in my bin – and yours – is much less food waste than there would be if our packaging and distribution system was not as sophisticated and technologically advanced as it is. Twenty years ago there would have been roughly the same amount of packaging in our bins, generated by far fewer goods. That's because the supply chain has focused on providing better protection for products, but doing so with far fewer resources and less packaging material.

Packaging has also responded to changes in lifestyle – for example mums working outside the home with less time for home cooking; more people living alone and needing smaller portions – in a way that few other industry sectors have done.

Wasting food is shameful, not least because 50% of the energy in the food supply system is used to grow and process food. Just 10% is used to make the packaging which prevents that investment going to waste.

The public are very aware of packaging after it has done its job and is in their bins. However, not only has it already prevented far more waste than it ever generates but over 80% of packaging can easily be recycled, so should not be in their bins at all. The other 20% is thin, lightweight material, often with food residues. This is better left in with the other non-recyclable waste and treated for energy recovery.

Food packaging actually has a net positive environmental impact.



Julia Hailes MBE

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What's in your bin?

Households in the UK throw away about seven million tonnes of food waste. If you add that to food waste from farms, food processing and catering we're chucking away a massive 24 million tonnes a year. And most of this is currently going to landfill.

There's a lot of public concern about food packaging and whether it's recyclable or recycled. But what many people fail to realise is that wasting food is far worse. In fact, on average the climate change impact of this is about 10 times worse than wasteful packaging. Around 20% of climate change emissions directly relate to the production, processing, transportation and storage of food – and yet we throw away about one third of the food we buy.

Clearly, we should be doing a lot more to use up the food we buy. But once it is discarded there are a whole lot more issues to worry about. Many councils, including in Somerset where I live, have set up separate collections for food waste – ours is collected in a brown bucket.

Not long ago I went to see what happens once it's been taken away. I discovered that it's being composted on a vast scale and the rich, fertile soil is then sold on to gardeners. That's great, but even better is anaerobic digestion (AD), which is just beginning to take off in the UK.

We need to reduce the amount of food that is wasted. But whatever we do throw away should be put to good use – let's give the thumbs up to AD and to separate food waste collection schemes.

What's in your bin?

Before City Harvest was founded, there was no system in place to rescue excess food in New York. In the early '80s, soup kitchens here were struggling to serve the growing number of people in need. Meanwhile, only blocks away, restaurants and bakeries were discarding unserved food.

A volunteer named Helen Palit was eating a potato skin appetizer one evening at a restaurant near the soup kitchen where she worked. She asked the chef what he did with the insides of the potatoes. When he said that he threw them away, Helen told him that her soup kitchen could use whatever he was able to give. The next day he donated 30 gallons of cooked potatoes. Within three months other local retailers and were donating unused food to the kitchen.

She founded City Harvest in December 1982, recruiting and training volunteers to handle the food safely and coordinating deliveries through a hotline. Since then City Harvest has rescued 269 million pounds of food.

The food businesses that generously donate are protected by New York State's Good Samaritan Law, which shields those making "good faith" donations of food from liability. Food safety is at the core of our work. We have refrigerated trucks to keep food properly chilled, and we make sure recipient agencies have Health Department-approved facilities. We have simple food packaging guidelines for donors to follow, and we provide a limited amount of packaging for food donors. Each donor gets a receipt.

Since our founding, we've helped launch food rescue programmes in Germany, England, India, South Africa, Brazil, Israel, and elsewhere. Visitors from all over the world have come to study our work and take back ideas for solving their own hunger problems.



Jilly Stephens

Executive Director, leads City Harvest's efforts to rescue food for hungry New Yorkers and the development and implementation of programmes in low-income communities to address hunger's underlying causes.

www.cityharvest.org

There is a long-held belief that food packaging waste is the main reason that UK landfill sites are almost full. However, it is not just packaging that gets buried – it is also the final destination for most of the 6.7m tonnes of food thrown away by households. The growing, transporting and storing of this wasted food accounts for 2% of all of the UK's carbon emissions.

Food waste has an impact on our pockets too, with over £600 a year added to the average family budget. That cost is largely avoidable, as most of the food is discarded due to incorrect or over-long storage. For our pockets and the planet, the priority should be to eat the food we buy.

This is why we believe packaging, product by product, must be examined as part of our efforts to cut food waste.

We found that wrapping individual peppers in plastic has no impact on freshness or quality so we stopped it. But wrapping cucumbers means that they last five times longer. Sensible packaging helps prevent food waste.

Supermarkets must help consumers understand better how to keep and store food too.

We've introduced 'Best Kept advice' stickers on fresh food. It advises, for example, the two-thirds of consumers who don't realise that apples stay fresh for up to 14 days longer if kept in a fridge.

We must tackle the confusion over 'best by' and 'use by' dates. One in two consumers say they unnecessarily throw away food when it reaches 'best by' date.

No matter how many steps we make, there will always be some waste. But to move towards zero waste to landfill we need an improved national infrastructure for collection and guidelines to use it productively. Our focus now – and in the future – remains on reducing packaging and food waste.



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Peter Jones OBE

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At last, what's in my bin and what happened to it before it got there is under sustained study in terms of resource efficiency conversion.

This supply chain is responsible for an estimated fifth of the UK carbon footprint, and uncomfortably much of the wastage in the system is self-inflicted. This is a result of single minded conceptions of 'progress' in terms of sell by dates, size, shape, cleanliness and orderliness.

Cradle to grave approaches are essential when considering the overall carbon entropy from farm to fork but there is growing realisation that waste by-product at all stages is inevitable. In terms of the input-output ratios, the numbers can no doubt be improved upon – 30 million tonnes of all food and drink is consumed each year with around seven million tonnes ending up in household bins. That's an attitudinal issue.

The rest, around a further 15 million tonnes of process, catering, agricultural product, is under attack. The threat of incipient electrical supply capacity constraints (due to off-lining life expired coal and nuclear), sharp increases in the cost of gas, and landfill gate fees moving from £7 per tonne to £100 over 15 years to 2011, are all producing interest in co-located conversion of scrap food carbon into fossil energy, displacing heat, power and gas. Anaerobic digesters are first out of the gate, but look out for food to hydrogen, ingredients refining and other more exotic options as technologies become bankable.

As ever the greatest problems create the greatest opportunities!

Re-packaging the recycling debate

Green Alliance's mission to 'design out' waste

Recycling has had a bad press recently. Packaging has had a bad press for much longer. The plethora of shapes and types of materials for recycling, and the daily confusion about councils' frequently-changing recycling routes cause considerable public annoyance. As a consequence, politicians have targeted packaging as the focus of 'voluntary' action by supermarkets and food businesses, and have succeeded in delivering some reasonable headline results.

Recently the debate has become more sophisticated. Policy-makers have twigged that a tonne of aluminium, for example, has a rather different environmental impact to a tonne of plastic (as it consumes much more energy in production) and thus a package should be judged not just by how much of it can avoid being landfilled, but by its 'whole life' impact.

Given the government's ambitious targets on carbon, it is no accident that the main focus of this debate is on the energy consumption of packaging through its journey from raw material to wrapping something, to the shop and eventually our bins. This has encouraged an illuminating journey by many retailers down their supply chains to understand where stuff comes from, how it is processed into something saleable, and, crucially, what your council does when you've finished with it.

This journey has yielded some important insights. One is that the main energy consumption may be in the processing of the raw materials, with different materials having very different figures attached to them, and those figures heavily influenced by whether material is recycled at the end of its life (because recycling saves energy compared with using new stuff). This leads to interesting questions as to whether very carbon-intensive materials such as metals should be used to package something as ephemeral as a fizzy drink. On the other hand, metals are pretty much indefinitely recyclable. These are not easy calls to make.

Another insight is that it feels artificial to separate packaging from product. If we consider supply chains in a more holistic way, should we not be considering trade-offs between the two? The packaging industry has latched on to the idea that since wasted food is, according to experts, a much worse carbon sin than throwing away packaging, packaging can actually be seen as having 'net environmental benefit'.

It would be silly to reduce packaging to the point where it failed to do its job, and it seems unlikely that any retailer would let packaging reduction get to that point. But without letting the packaging industry off the hook, there is a valid point here about understanding the minimum packaging needed to prevent waste of all kinds.

Perhaps the main dilemma thrown up by the more considered view of packaging that is emerging concerns the lack of co-ordination between those designing and marketing packaging, and those who collect

and do something useful with it once we've chucked it in the bin. Nothing illustrates this better than the saga of 'compostable' packaging (you may also have seen the term biodegradable bandied about). Compostable packaging includes anything made from paper or card, but here we are talking about the new generation of clever plastic-like materials, made from trees, corn or, occasionally, crop wastes. They are thus made from a 'renewable resource' unlike oil-based plastic, which is quite properly considered a 'non-renewable resource'. Some retailers see these materials as a good 'sustainable' proposition.

The trouble is, there is little point in anything being compostable if it doesn't get composted. Consume a biodegradably wrapped sandwich in the office or the street, and the packaging will end up in a conventional bin. If you don't compost at home, (and there is some doubt that these materials degrade satisfactorily on home compost heaps) you have only one route to send the biodegradable packaging to a truly sustainable end, and that is if your council collects food waste and you remember to add it to that. Even then, the council's ability to deal with it relies on them having a compost contractor prepared to take the materials, because if they are accidentally oil rather than plant plastic, they will have to be removed.

All of which goes to illustrate that 'designing out waste' (the Green Alliance's current mission) is about not just how we design packages, or the products inside, but about designing a whole system. Products of all kinds should be designed with re-use, recovery and recycling at their heart, but this needs to be done in tandem with local authority and industrial waste collection schemes that are easy to understand and consistent, and collect stuff in the way that will yield high-quality materials for the re-processing markets. If we do this well, it is more likely that we can establish recycling markets closer to home than shipping them across the world. The key is to treat recycling as the norm for entire supply chains, not as an afterthought borne almost solely of a desire to avoid landfill. ■

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There is little point in anything being compostable if it doesn't get composted

Tackling food and packaging waste

A win-win for producers, suppliers and consumers

WRAP (Waste & Resources Action Programme) is well-known for its work on reducing packaging and food waste at household levels, but in recent years the focus of its retail programme has widened to include the whole of the food chain, from the factory in-gate, through manufacturing, to back-of-store and distribution networks, and encompasses packaging, product and food waste.

In 2005, we were instrumental in shaping the Courtauld Commitment at a Ministerial summit where the Environment Minister and Chief Executive of WRAP met with senior representatives from the majority of the leading UK grocery retailers, as well as the British Retail Consortium.

The Courtauld Commitment is a voluntary agreement between WRAP and major UK grocery organisations, which supports less packaging and food waste ending up in household bins. It is a powerful vehicle for change and, in 2008, led to zero growth in packaging despite increases in sales and population.

The Courtauld Commitment is just one driver for WRAP's work with industry along the food supply chain.

We are currently working on two key steps in understanding and tackling the problems of waste in the food chain.

The first part of this work is to understand why and where waste is generated – identifying the 'hot spots' in the chain

from the factory in-gate, through manufacture, distribution and to back-of-store. As part of this we are developing baseline data for 2008 on

packaging, product damage and food waste generated within the UK retail supply chain within traditional grocery and home improvement, obtaining data from a number of companies from across the chain. The results will be aggregated to provide a broad picture of the amount of packaging, product damage and food waste being generated. This will be broken down by category and into the specific stage of the supply chain.

We're confident that this level of analysis will give us a baseline dataset for 2008 from which year-on-year change can be assessed. This information will, more importantly, form part of the evidence base used to identify key product categories and opportunities for improvement in the supply chain. It will allow us to identify examples of good practice and areas where we can encourage sectoral intervention – where more than one company needs to be involved to deliver the benefits from cost and carbon savings.

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Cradle to cradle

No harder to understand than 'recycling'



Michele Field

Writer and Slow Food London 'thinker' on Slow Food policies. She is writing a historical analysis of why food tastes are so selective, given the amount of edibility that surrounds us.

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Michael Braungart

Holds a professorship at the Dutch Research Institute for Transitions (DRIFT) at Erasmus University of Rotterdam in collaboration with the TU Delft. He has developed tools to design intelligent, aesthetic and eco-effective products and business systems, gives lectures and teaches at universities.

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urban life and hard to curb. So along with the urine-waste, water resources are laid to waste.

The Environmental Protection Agency of the EU decided that sweeteners are safe for human consumption, and yet are slow to reach the next conclusion: that everything 'safe' for us may not be safely excreted into the environment. Michael Braungart has been especially concerned about sucralose, but now German studies have shown that most sewage treatments cannot detect other sweeteners either – not saccharine, not acesulfame, not cyclamate, not aspartame, not neotame, not neohesperidin, not dihydrochalcone. (You don't want me to go on.) Removal rates in Germany's treatment facilities (which are way ahead of the USA and UK) are still described as "limited". There are better results for removing saccharine and cyclamate than the others.

For cradle protocols, however, the question is not what can be removed

We are also carrying out research at product level. Cranfield University, in conjunction with the IGD and Fresh Produce, is developing detailed 'resource maps' (quantifying food waste and packaging waste arisings) through the fresh fruit and vegetable retail and wholesale supply chain. Eleven products will be considered.

For example, we will be looking at the total number of bananas imported into the UK and then track how many are lost at the pack houses, in distribution and to store or the wholesale market. This data will also be linked up to our detailed understanding of bananas at home. As part of this, the reasons for waste arising will be identified, and good practice guidance will be developed and disseminated.

This is one of the key projects in the Retail Supply Chain Programme, delivered jointly by WRAP and Envirowise. However, we anticipate that the data it generates will allow us to identify avoidable and unavoidable food waste. From that we hope to help companies identify opportunities for improvement and benchmark against good practice.

The first resource mapping exercise is underway with DHL and is due to report later this year. We have plans to expand both strands of work, to include meat and dairy, fish, and other products such as ready meals, all of these being short shelf-life products where there is potential for higher levels of waste.

We are also working with industry bodies such as the Food and Drink Federation, as well as with food manufacturers and retailers on an individual level, to help reduce waste in the supply chain, from factory in-gate right up to household level.

It is also about considering where packaging best sits in the chain. For example, when a tube of tomato puree is packaged in a cardboard box, the consumer has to recycle that box. But we know that because only 34% of people recycle, it's likely that the box won't end up in the recycling bin.

We worked with the Co-operative to remove the box and place the tubes in a shelf ready box which would increase the amount of packaging used in store. This reduces overall cardboard use by 35% and also increases the recycling rate of the cardboard as in-store recycling rates are much higher: sometimes over 90%.

This kind of thinking could be applied to other products and has benefits for the whole supply chain, using fewer resources, and making sure that what we do use is re-used. It also helps meet the expectations of consumers who are looking for less packaging on their products.

Our work along the food supply chain is just beginning. This is about bringing a fresh pair of eyes to the table and considering the whole life of a product from its manufacture through to its final consumption and disposal. What we need to do is first of all identify the 'hot spots' and then prioritise them and work with the retail sector to deliver this measurable change.

It has been estimated that £858 million could be saved each year by no-cost or low-cost efficiencies in waste reduction within the UK food and drink manufacturing sector¹ – the opportunities are enormous.

Voluntary commitments such as the Courtauld Commitment are one of the ways that this could be achieved, expanding it to go beyond just household packaging and food waste to maximise the efficient use of resources throughout the chain; creating a win-win for manufacturers, retailers, consumers and the environment. ■

Further information

1 Defra, Quantification of the Business Benefits of Resource Efficiency by Oakdene Hollins and Grant Thornton, October 2007.

For further information and examples of packaging and food waste reduction visit: www.wrap.org.uk/downloads/CC_Case_Studies_18_May_2009_final1.fc563cb4.6249.pdf

Local Food demonstrates the power of working collaboratively, and in today's culture of supermarkets and food miles, an explosion of activity at community level is urgently needed. This book is the ideal place to start.

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'nutritional' for the next user – and very likely to be toxic. His students at the University of Luneberg analysed mothers' breast-milk and discovered 2,500 chemicals which are outlawed by the EU for imbibing in any other way! Michael laughs but says seriously that breast-milk is also a 'waste process', as the process slightly detoxifies the mother.

Sucralose is 800 times sweeter than sugar and when it is excreted in your urine (after that low-calorie cola), waste-water systems cannot filter it out of the effluent. The 'joke' is that there are now three kinds of water on the surface of the planet: fresh water, salt water, and sweet water. Except, just as once there was a worry that salt water would contaminate fresh water, now sweet water is contaminating everything and we have no idea of the damage this might do.

There are now three kinds of water on the surface of the planet: fresh water, salt water, and sweet water

That is not just 'waste'—it is 'exponential waste'. A few hundred years ago your urgent deposit of a 'waste' product (your pee) might have been gratefully accepted by the plants bordering your backyard pond. Now it might be toxic to the marine and plant life. The global market for sweeteners is about \$2-billion a year for American manufacturers alone, and because natural sugar-growing economies (beet, cane, etc) are not located in the most populated parts of the world, sweeteners are an increasing feature of

Cradle-to-cradle philosophy began with the mantra "waste equals food", but gradually its proponents have refused even to accept that 'waste' has a valid existence. The phrase has become "food equals food". That means, in a perfect system of full-cycles, at a certain point everything once used either becomes a nutrient for something else, or if it is an environmentally toxic product (say, the electronic parts of a machine) it can be disassembled and the components can be redeployed, harmlessly. In fact, "harmlessly" is the wrong word: they are a benefit because they are locked into a long conservation programme.

When this applies to food, there are some twists and turns. Originally most human food was excreted and "night soil" became a nutrient, not a waste product. Nowadays, when nearly 50% of the world's people are living in cities, the processing of their rich night soil is usually a treatment that concentrates on putting a distance between that 'waste' as a contaminant, rather than recapturing, for example, the phosphates. Phosphate in soil is reaching a critically low level and it may run out even before fossil fuels do, crippling crop production. The human food chain is a perfect example of how once-natural cradle-to-cradle systems need to be restored by new technology.

But when 'mad cow disease' anxieties removed animal-excreted "waste" from repeated nutrient cycles too, the "cradleness" of agriculture largely broke down. Tristram Stuart has made the argument for the reinstatement of slurry in his book *Waste* – there is no need for me to repeat it. I want to use an example not of a mind-blowing infection like 'mad cow' but of an environment-killing one, which comes in our human-'waste' package.

Michael Braungart, the originator of cradle approaches, has been speaking to EU government committees about sucralose in particular and sweeteners in general. The iron rule of biological "cradleness" is that anything which does not degrade and rejoin the biological cycle is unlikely to be

Cradle to cradle

from water supplies, but the fact that anything which does not biodegrade (regardless of waste treatments) needs to be avoided. Anything we add to our diet needs to be designed so that it does not need to be removed. Instead, the sweeteners are in your local drinking water. (Should we protest and start a campaign against drinking water, just as the 'take-tap-water' campaign in the UK has been won?) Increasingly they are in the 'fresh' water on which food plants and animals rely and may be slowly changing the character of farm-soil and rivers. For ground-surface water, acesulfame is a critical concern. Perhaps scary research regarding the re-ingesting of the sweeteners – say, "sweet water" mixed with babies' milk formulae – is on the horizon.

There is no way for you to buy local fish "free from" this problem, because we don't even grasp the impacts yet. The cradle advice is just to stop the use of anything like sweeteners which will not rejoin the biological cycle – at least, Michael Braungart says sadly, "while the research machinery keeps rolling". His hope rests with big real-sugar companies highlighting the effects, but some of those companies themselves now have a supplementary line in sweeteners. Cradle to cradle is not opposed to artificial sweeteners per se, but we are distressed by anything which is put in the food chain and disrupts it. Michael's phrase for this is "chemical harassment". When he is thirsty he has no option but a glass of tap-water that has been "sweetened" for him.

Unlike the rest of the waste industry, and most environmental campaigns, cradle to cradle does not start with the "free from" position. The food products carrying sweeteners succeed because they are "free from" calories which conventional sugars produce. If you want to do waste issues from our standpoint, you begin, instead, by positively identifying what is there – not by finding novel solutions to its incineration or ways in which it can do

'less' damage. It is the years of slapping ourselves on our own shoulders and saying "no lead" or "no salt" which have created a deluding "ecologism" where doing-without is the solution. Look at what you are doing, not doing without.

Of course there are 'transitions' in this cradle-emerging economy. A waste issue for food packaging (which remains about a quarter of household waste in Western economies) is food packaging. PLA (polylactic acid) is what the food industry should use because it is biodegradable, but PLA comes from the same food-resource (maize) on which we rely for food itself. In some places, of course, the packaging production will compete with the hungry children. There

Anything we add to our diet needs to be designed so that it does not need to be removed

should be no competition between PLA production and food production – that is as misconceived as using maize and farmland for biodiesel. At the moment, there is no technology to 'up-cycle' PLA either – and we are working on it.

Twenty-five years ago Michael, who founded the international chemistry division of Greenpeace, was asked by the German Parliament for advice on PVCs (polyvinyl chloride), the world's third most-used thermoplastic polymer. His advice was the same as his advice for sweetener manufacturers: just stop. After 25 years the German government decided to ban PVC... in toys for children under the age of three! Meanwhile, it leeches into our diets, it is an endocrine disrupter, and

it is increasingly implicated as a cause of obesity in children.

These are not "waste" issues (dispensing-with, or eradicating issues). The only approach is to identify what we have – not to incorporate anything into our stomachs and our environment if, like PVCs, it is not part of the technical cycle, or if like sweeteners, not part of the biological cycle. There are now cosmetics companies where enlightened research departments flip into cradle mode, but most of the converts have been in manufacturing. There are no food companies that accept the whole agenda yet, unfortunately.

Michael Braungart does not want this to be a problem where ethics become accusing. There is, however, no governmental agriculture, fisheries, food or environment department that crosses the threshold of these issues. (The solutions are not simple, but creating the research funding is.) Michael says that we have shown no ambition with de-constructing the very concept of "waste".

The bar is too low. "Less waste" is no answer, nor is more efficient recycling. Nor is reducing production to a minimum so that we stop the creative, economic cycles that have built better products, kept supermarket fish in remarkable condition, given us wrapped cheese that tastes almost the way the way that god makes it in Parma, and provided infants with safe powdered-milk. It is a steep curve for the food waste-industry, but the next step is to take on the wider concerns -- those concerns for the environment as a whole and (as cradle chorus goes) "for our children's children". ■

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Michael Braungart is the creator of the cradle to cradle approach and his office, EPEA, is in Hamburg. Michele Field works with cradle protocols in the UK.

One planet living

Solutions for reducing seven million tonnes of wasted food



Jane Hersey
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Environmental charity BioRegional is working on a range of practical projects and partnerships that demonstrate how we can live within our fair share of the earth's resources – or as we call it - one planet living. We have seen that in developed countries a large part of our resource use comes from our food – in the UK, food makes up a quarter of our total resource use. And as the UK is currently living far beyond its global fair share of resources, the country's food impact alone is close to taking up the UK's total fair share of resources. In this article we will look at how strategies for reducing food waste can help us move towards one planet living.

We run a global One Planet programme where we work with partners to set up exemplar communities and businesses that demonstrate one planet living in action – we aim for them to inspire greater change.

When we talk to people about this work they often ask "But how do we know when we are sustainable?" BioRegional

uses Ecological Footprinting to try to answer this question. This environmental accounting methodology calculates our demand on the earth's regenerative biocapacity. It shows us that if everyone in the world lived as we do in the UK, we would need three planets to support us – so for the UK to be sustainable we need to reduce our impact by at least two-thirds across the board.

If everyone in the world lived as we do in the UK, we would need three planets to support us

One quarter of the UK's three planet lifestyle is due to food consumption, which surprisingly is higher than the impact of either our household energy

or transport. As food is a basic need it could be argued that it is a special case, and that greater cuts should be made elsewhere such as from non-essential goods. However, as we throw away nearly 7 million tonnes of food a year in the UK there are clearly some areas of non-essential food use which should provide relatively easy ways to reduce the impact of our food.

Projects within our One Planet programme use the ten one planet principles as a framework for delivering measured sustainability and happy, healthy lifestyles. Two of the principles



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relate directly to the issue of food waste – ‘zero waste’ and ‘local and sustainable food’. Zero waste means working towards a future where the concept of waste is eliminated in favour of recycling and reusing materials and local and sustainable food entails choosing low input, local, seasonal and organic diets.

The on-site grocery store will compost any spoilt food within the village for food growing by the community supported agriculture scheme

Practical projects within this programme include One Planet Communities – new and retrofitted mixed-use communities. When developing strategies for their delivery, we take an evidence-based approach to identify the steps that need to be taken to reach true sustainability. In the case of food waste there is a simple hierarchy that we follow.

Clearly reduction of food waste should be the first priority. This applies whether we are talking about the waste generated at the point of consumption or as part of the food production and supply system. Reducing food waste in the home can be achieved by simple behavioural changes such as those promoted by the government’s Love Food Hate Waste campaign. The campaign suggests some simple things that we can do to reduce our personal food waste, such as: planning meals well in advance, not going shopping while hungry, keeping an eye on sell by dates and making meals from leftovers.

In parallel with the message for households, the same advice should apply to businesses and other institutions. The belief that “no good food should be wasted” is held by FareShare, the national charity that

redistributes surplus ‘fit for purpose’ food from the food retail industry to organisations working with disadvantaged people in the community. As you’ll read elsewhere in this magazine, in 2007, food redistributed by FareShare contributed towards more than 4.5 million meals, saved local charities approximately £5 million and helped businesses reduce CO2 emissions by nearly 20,000 tonnes. This is a perfect example of a virtuous cycle, or a win-win situation for all involved, yet this kind of activity is tiny compared with the huge amounts of good food still wasted.

After waste reduction and redistribution measures have been prioritised we are left with the challenge of finding the best way to dispose of the rest of our food waste. The preferred option for people living in homes with gardens should be home composting. This is a low-tech, low-cost method that provides the best environmental option – no inputs, no emissions or congestion from transport – just a basic skill that anybody with a garden can learn. Some home composting systems (such as wormeries, bokashi or green cones) can even deal with meat or cooked food waste.

However, in the case of residents living in flats it will be vital to provide a separate food waste collection scheme. Development partners BioRegional Quintain and Crest Nicholson are currently developing One Brighton. This One Planet Community comprises 172 apartments plus office and community space and will be the UK’s greenest apartment scheme. The project’s exemplary low food impact strategy includes green facilities management, roof top allotments and an in-vessel composting system in the basement.

The new Sonoma Mountain Village, a One Planet Community in California, is also planning to reduce food waste on-site. Developers Coddling Enterprises are working to set up a daily local farmer’s market in the town square. As well as being a fantastic community facility, the market should also help to reduce food waste as residents will shop on a more frequent basis rather than

doing one big shop a week, which can often lead to food being wasted. In addition, the on-site grocery store will compost any spoilt food within the village for food growing by the community supported agriculture scheme.

In Shropshire, a digestion plant diverts over 500 tonnes of food from landfill annually

When collected at a municipal level ideally food waste should be treated using anaerobic digestion as this can create energy as well as disposing of waste. Anaerobic digesters work by breaking down food to produce biogas which can be used to create renewable electricity or even to power buses, as in Europe. In Shropshire, process engineering company Greenfinch operates a digestion plant that diverts over 500 tonnes of food waste from landfill annually.

Overall, the use of this hierarchy and the examples of best practice show us that we do already have the tools to solve our food waste problem in a cost-effective and low impact way. However, we need a range of actions including personal behaviour change, small low input systems combined with some larger technological solutions. Each has its part to play in helping us to achieve a sustainable one planet lifestyle. ■

BioRegional’s on-line One Planet Calculator and Action Plan tool allows users to assess the ecological impact of their lifestyle and take action. <http://calculator.bioregional.com>

No good food should be wasted

FareShare's solution is practical and creative



As we know, a third of households’ food purchases end up in the bin. And because of the economic downturn and the rise in food prices, more of us are watching more closely what we eat and what we buy.

But the fact is that hundreds of thousands of tonnes of food are being disposed of every year – despite being perfectly good to eat – before they even reaches consumers’ baskets. In the commercial world, food becomes waste when it cannot be sold and has ‘no commercial value’. Some of this food is treated as waste for reasons as varied as packaging errors, short shelf-life and marketing promotions that have ended. As a result an estimated 125,000 tonnes of fit-for-purpose food is being disposed of in just the retail sector every year. This food is still fit for human consumption and has the potential to be redistributed to people who need it.

And sadly there are people who need it. In this country alone, four million people are unable to afford a healthy diet and seven million people are affected by low income – perhaps the most critical factor leading to food poverty.

FareShare’s own research shows that 17% of people using the services of charities admit that they have gone without a square meal for a week or more in the last year. Furthermore, a staggering 46% are unable to buy food on a regular basis.

Over the last five years, FareShare has been creatively addressing these combined issues of food waste and food poverty by redistributing this surplus quality food to a network of community organisations that support vulnerable people in the community.

In fact, since the charity became independent in 2004, FareShare has redistributed over 11,000 tonnes of food, thereby contributing towards a staggering 21 million meals – equivalent to feeding every man, woman and child in greater London. It is also the equivalent to 800 lorries’ worth of food, which – nose to tail – would cover a distance of 9 miles.

This food has considerable impact on those who benefit from it. Our own National Impact Survey reveals that 92% of the clients using the services of charities say that the food provided to them helps them stay fit and healthy and 67% of the organisations receiving the food are also able to reinvest saved funds into other support services that enable their clients to rebuild their lives.

Uniquely FareShare, a registered charity, achieves all this by offering the food industry a business solution to the problem of managing food waste, while at the same time offering them cost savings if they engage sufficiently. On top of this, the activity has significant social and environmental benefits, which helps businesses achieve their own

community and environmental targets. Not surprisingly, this solution is proving popular with the food industry.

FareShare acts as a waste management company handling a business’s waste, but offering a unique disposal method, by ensuring that surplus food is consumed by the poorest in the community, and thereby preventing waste. Importantly, FareShare does not accept charitable ‘donations’ of food; this is a ‘paid for’ service; which will help sustain the charity’s activities in the future.

FareShare has redistributed 11,000 tonnes of food since 2004, equivalent to feeding greater London

At the same time, regardless of improvements in the forecasting and buying of food, the fact is that waste will continue to arise, as long as the food industry remains as competitive a market place as it is and as long as we, the consumers, demand the choice and convenience that 21st century retailing delivers.

It is in everyone’s interest, not least the government’s and the food industry’s, to ensure that food that is still fit-for-purpose is consumed. We are appealing to the government to set clear targets to prevent good food being destroyed and for the industry as a whole to engage in a practice that has shown demonstrable results, to the benefits of the environment and our communities.

In the meantime, while these twin blights on our society exist, FareShare will continue to offer its creative solution. ■

www.fareshare.org.uk

Tony Lowe

Recruited by Crisis in 2003 to establish FareShare as an independent charity. Prior to that, he worked for M&S food division and Alliance Unichem, as well as Oxfam Trading.

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Averting the environmental food crisis



Achim Steiner

Achim Steiner is UN Under-Secretary-General and the Executive Director of the United Nations Environment Programme (UNEP), the UN's voice on the environment. Before joining UNEP, Mr Steiner served from 2001 to 2006 as Director General of the World Conservation Union (IUCN)

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The way agriculture has been practiced for past half century or so has achieved some remarkable results in terms of lifting large numbers of people out of poverty and generating a range of food products certainly in developed economies unthinkable to our grandparents.

But maximizing food production at all costs, without factoring in the impacts including the losses and waste of what is harvested – from the farm, via storage and distribution and into the retailers and our kitchens – cannot be sustainable in the medium- to long-term.

We need to take a systems approach to agriculture and farming and recognize that no simple silver bullet exists to balance the need to feed people with the imperative of conserving and investing in economically-important ecosystems, such as fertile soils, and biodiversity, such as pollinators, and freshwater infrastructure like forests, wetlands and river systems.

I believe we have more options to deliver sustainable agriculture than perhaps is fully recognized if we are aware and more sophisticated in the response – perhaps we can start with food waste as one accelerator to a green revolution – but with a capital G. ■

The question of waste is emerging as part of an overall concern over the way the global economy produces, consumes and distributes food.

It forms part of the multiple challenges the world faces but also the opportunities for a transition to a low carbon, far more resource efficient Green Economy so urgently needed in the 21st century.

In response to the recent – and some may say continuing – food price crisis, UNEP commissioned a team of internal and external experts to bring an environmental perspective to an issue that triggered riots in many developing countries and pushed many back into poverty and hunger.

The overall conclusion of the Environmental Food Crisis: 'Environment's Role in Averting Future Food Crises' report was that we need a green revolution but with a capital 'G'.

In other words the economic and agricultural models of the 20th century are unlikely to serve us well on a planet of six billion people, rising to over nine billion by 2050 – unlikely to deliver the goods if farming continues to externalize the costs of its impacts and to work against, rather than with the multi-trillion dollar ecosystems services that underpin agriculture, and indeed all life on earth, in the first place.

The issue of food waste was perhaps, to me, among the most extraordinary findings of the report as it represents not only a waste of a important commodity but also a waste of fossil fuels in terms of the chemical inputs and energy required to produce, harvest – or in the case of fish – catch food in the first place.

Waste too in terms of the transport of food around the world, and then the discarded or spoiled food that is thrown away and presumably in large part is left to rot in landfills, triggering further emissions of greenhouse gases.

And, of course, the wasted opportunity to feed billions of hungry or

undernourished people and thus accelerate the achievement of the UN poverty-related Millennium Development Goals by 2015.

The UNEP report, presented to our annual gathering of environment ministers held this year at the organization's headquarters in Nairobi, Kenya, found:

- Over half of the food produced today is lost, wasted or discarded as a result of inefficiency in the human-managed food chain.
- Losses and food waste in the United States could be as high as 40-50 per cent, according to some recent estimates. Up to one quarter of all fresh fruits and vegetables in the US is lost between the field and the table.
- In Australia, it is estimated that food waste makes up half of that country's landfill. Almost one-third of all food purchased in the United Kingdom every year may end up not eaten.
- Food losses in the developing world are also considerable, mainly due to spoilage and pests. For instance, in Africa, the total amount of fish lost through discards, post-harvest loss and spoilage may be around 30 per cent of landings.
- Food losses in the field, between planting and harvesting, could be as high as 20-40 per cent of the potential harvest in developing countries due to factors such as pests and pathogens.

This underlines the need for greater agricultural research and development which in Africa amounts to just 13 per cent of global investment, versus over 33 per cent in Latin America and over 40 per cent in Asia.

Yet there is also within the report the view that the world could feed the entire projected population growth of the coming decades by becoming more efficient and more intelligent in the way food systems are managed.

Wasted food, lost water

Ethical imperatives for water conservation



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Fix leaky faucets, use low-volume toilet tanks, run the washer with full loads. These are just some of the many water saving behaviors commonly practiced by millions of people conscious of the need to conserve water and energy. In a growing number of communities, individual action, treatment and recycling are definitely helping to reduce water waste.

The largest consumer of water is agriculture, which has been a centre of attention for water saving practices for some time. Most of that attention has focused on ways of reducing water for crop production. Technical innovations and improved land management and farming practices have made great strides, but it's time move past the farm gate.

The loss of food between the farmers' field and our dinner table – in food storage, transport, food processing, retail and in our kitchens – is substantial. Considering the amount of water required to produce our food, lost and wasted food amounts to lost and wasted water. It stands to reason that reducing food loss and food waste can substantially reduce agricultural water.

Food waste is part of the world's looming water crisis. In the US alone, annual food production requires about 120 cubic kilometers of irrigation water. That's roughly the amount of water in Lake Erie. We waste approximately 30% of the food produced with this water, which amounts to 40 billion litres of irrigation water. That is enough water to meet the household needs of half a billion people.

How we lose water from field to fork

What happens to that 30% between the field, where it is produced, and the fork, where it is consumed? In developing countries, pests, pathogens and poor post-harvest technologies account for as much as 20 to 40% of the harvested crop. Conservative estimates indicate another 10 to 15% is lost in processing, transport and storage. If we take lost quality into account, loss in these links of the food chain could be as high as 25 to 50%. In developing countries, food waste in households is estimated to be around 10%. Not much gets scraped off plates into the waste bin here.

In developed countries, post harvest, storage and transportation technology tend to be better, but there is still considerable loss. What we are seeing now is the increasing role of consumers, supermarkets and the food industry in generating waste. In the US, around 25% of fresh fruit and vegetables sold in retail stores are not consumed. A recent report from Sweden suggests that families with small children throw away that much of the food that they have bought and carried home. Studies in the UK indicate a similar level of waste. Further losses occur during retail in the form of discarded perishable products, product deterioration, and 'plate waste' – the food that gets thrown into the garbage bin.



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How sustainable is the food on your plate? . . .

... dig deeper



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A blind spot on water

With the world's population forecast to reach nine billion by 2050, that is food we can ill afford to waste and the reason a lot of people are talking about the need to increase food production. The problem is, if we increase production using the same water-wasteful methods we are using now, agriculture will need twice the amount of water it currently consumes. Even without the increase in demand from non-agricultural users, that much additional water will be hard to come by in many parts of the world. In fact, given the increasing demand for non-agricultural water and some of the predicted impacts of climate change, it's a sure bet that agriculture in most parts of the world will have to learn to get by with less water.

Our blind spot is that we see the problem of food production as a 'shortage' problem and not a water waste/efficiency problem. The conventional response to problems of shortage is to increase the volume of production, hence the research in is ever higher yielding plant varieties, fertilizers and genetic engineering. The other approach to increasing production is to reduce waste and increase efficiency. On a global scale, we are already producing roughly double the amount of food required to provide the current world population of 6.6 billion with enough calories to lead an active, healthy life.

Sadly, there is a huge imbalance. Globally, there are roughly 50% more people who are overweight and obese (1.2 billion) than there are malnourished (860 million). It would unrealistic to think we could eliminate all waste or redress all imbalances, but there is considerable room for improvement.

Bad news is good news

The sheer scale of the problem is good news. Because water loss along the market chain is so enormous and occurs at so many points, we have lots of entry points for improving water efficiency: farmers, agricultural workers, truck drivers, the food industry, supermarkets, government officials and individual consumers. Raising awareness is a good first step, but not sufficient on its own. People need tangible incentives to change their behavior. Supermarket chains learned very quickly that a tiny discount was needed to encourage people to use those good-for-the-environment, cost-saving, non-plastic, reusable shopping bags. We need to get similarly creative with incentives for saving water.

Reforming the policy environment offers the best return on our efforts to reduce the enormous waste of water in our food chain. We need policy that encourages investment in post-harvest technologies; that looks more closely at the role of the food processing industry, supermarkets and pricing mechanisms; and strategic efforts to reduce food waste and – in the west – over-consumption. Of course individuals have an important role to play, but suggesting that the entire enterprise of reducing waste is an individual responsibility amounts to a clever deflection of responsibility by vested interests and a cop out by politicians.

Wasted food, lost water

The bottom line is, we need to produce our food with less water. As a starting point, we need to include reducing the loss and waste of food from field to fork as part of a sound and rational water management policy. Reducing loss and waste helps ease the pressure on our water resources and frees up land and water for other users. The livelihoods of millions of smallholder farmers would be enhanced, reliable supplies to industry would be improved and consumers would benefit in terms of quality, stable prices and food security.

To achieve these ends we need to start setting targets to reduce food waste. Taking as a reference point the UN Millennium Development Goals and with due consideration to the magnitude of losses and the potential gains, a reduction by 50 percent across the chain from field to fork is not unrealistic. There are ample opportunities to produce more food with less water in rainfed and irrigation systems across the globe, and that has been a topic of in-depth study within organizations like the International Water Management Institute.

Next, we can tackle lifestyles and consumer behavior. With increasing disposable income, urban lifestyles and the influence of the food industry and supermarkets, the stages in the food chain beyond production are ever more important. Studies show that people living in cities,

particularly in developed countries, display an alarming level of ignorance with regard to food. Most urban consumers interviewed in these studies simply did not think about meat, dairy and fruit as the produce of living things that use natural resources to grow. With increased distance between farms and food consumption sites, and the increased processing and packaging of food, this dangerous lack of awareness will only increase. It is dangerous because unaware consumers are less likely to question and change their behavior or support policy changes.

Finally, we need to get waste reduction and food production efficiency back on the political agenda. In the 1970s and 1980s, there were several landmark studies on global and regional post-harvest losses and waste. Over the last few decades, other issues have taken centre stage. With populations and food prices rising and the impacts of climate change becoming clearer, it is time to get waste back on the agenda. We have the means to reduce food waste and increase food production efficiency. All we need now is the will.

Interested readers are invited to download Saving Water: From Field to Fork: Curbing Losses and Wastage in the Food Chain (http://www.siwi.org/documents/Resources/Policy_Briefs/PB_From_Filed_to_Fork_2008.pdf).



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**Waste: Uncovering the Global Food Scandal**

Tristram Stuart | 2009 | Penguin | ISBN 978-0-141-03634-2

A fascinating exposé of the shocking waste in the global food system. Stuart tells of post harvest losses in developing countries that could be avoided by providing cardboard boxes to farmers, and appalling wastefulness of Western snack bars and cafes. He traces the links between the world's hungry and full. But despite these huge divides, his message is clear and positive: buy the food you need, and eat the food you buy. EB

Food, Inc.Karl Weber ed. | 2009 | PublicAffairs Books
ISBN 978-1-58648-694-5

Companion book to the film 'Food, inc.' this is a series of essays by some of the world's experts on food and related issues, Eric Schlosser, Marion Nestle and Muhammad Yunus among them. The chapters deal with different aspects of the corporate food industry, what it means for citizens, and how we can challenge the status quo. EB

The Crisis of Food BrandsLindgreen, Hingley & Vanhamme eds. | 2009
Gower Applied Research | ISBN 978-0-566-08812-4

Cutting edge research on some of the most hotly contested controversies in food and agricultural marketing. From Coca-Cola's Dasani launch to functional foods, from green consumerism and fair trade to supermarket power, this is a must-read for anyone interested in food marketing. EB

The New Cultures of FoodLindgreen & Hingley eds. | 2009
Gower Applied Research | ISBN 978-0-566-08813-1

Changes in our food landscape, brought about by the rich mix of religious, ethnic and cultural groups in the UK and Western Europe, present a fascinating set of opportunities and challenges for food businesses. This collection of essays looks in detail at those opportunities, and what they mean for the future of food and food marketing. EB

The World of SoyDu Bois, Tan & Mintz eds. | 2009 | University of Illinois Press
ISBN 978-0-252-03341-4

This book explores how and why we eat soya, as a food and near ubiquitous ingredient. By focusing purposefully on soya for human consumption, as opposed to for feed or industrial uses, it makes a virtue of what at first seems an odd omission. TM

GlobesityDelpuech, Maire, Monnier & Holdsworth eds. | 2009 | Earthscan
ISBN 978-1-84407-667-3

Obesity is no longer a disease of the 'McDonaldised' wealthy. It is a global pandemic that is spreading across developing and industrialised countries alike. Our innate taste for fat and sugary foods has met its perfect match, a food industry that produces these products cheaply and at huge profits. Globesity tells the tale of how our high-energy and low-quality diets are bringing us to the brink of a public health disaster. SR

The Food EconomyBunte & Dagevos eds. | 2009 | Wageningen Academic Publishers
ISBN 978-90-8686-109-5 | €43

The Food Economy takes as its starting point the largely behind-the-scenes transformation of our food system in recent years. But, as it becomes more complex, it also incorporates issues previously considered as external to food economics, like trust, CSR and ethics, as well as economics and safety. This book acts as a bridge between those worlds, and attempts to reconnect consumers to the food they eat and the people that produce it. EB

Ethical Futures: Bioscience and Food Horizons

Millar, Hobson West & Nerlich eds. | 2009 | Wageningen Academic Publishers | ISBN 978-90-8686-115-6 | €59

'What has social justice got to do with sustainable food?'; 'When does a new technology pose novel philosophical problems?'; 'What kinds of moral view about the human-animal relationship will predominate in the future?' These are just three of the myriad ethical issues addressed in this fascinating exploration of what the future holds for agriculture and food production. SR

Famine: A Short History

Cormac O Grada | 2009 | Princeton | ISBN 978-0-691-12237-3

A fascinating read, this book delves into the role of population pressure, food markets and government intervention in preventing or provoking famines, O Grada's insightful historical account depicts the horrors of famine in the last five thousand years, and analyses in depth the causes of mass starvation. SR

Feeding the World

Giovanni Federico | 2009 | Princeton | ISBN 978-0-691-13853-4

A comprehensive global economic history of agriculture. In contrast with the first 12,000 years of farming, the last 200 have seen the world population increase from 1bn to nearly 7bn while the amount of food grown has increased 10 fold. Federico has produced a balanced and sensitive text which is essential reading. ABC

The End of Overeating: Taking Control of the Insatiable American Appetite

David A. Kessler | 2009 | Rodale Press | ISBN 978-1605297859

Despite testimonials from some well-respected critics of our food system, this volume fails to live up to its title. Kessler, former director of the US Food and Drug Administration and a paediatrician, does an adequate, though repetitive, job of showing how the food companies have discovered how to make us eat too much by layering fat, salt, and sugar. But only neoliberals will applaud his solution: greater individual willpower developed via a trademarked method he calls Food Rehab®. Indeed, the volume only notes in a sentence or two that it might also be necessary to change food regulation if we are too avoid a global public health problem. (Reviewed by Lawrence Busch, Professor of Standards and Society, Centre for Economic and Social Aspects of Genomics, Lancaster University)

restaurant review

The frontage to Acorn House is so well camouflaged that my companion cycled straight past it. Housed on the ground floor of an unprepossessing office building, once inside, everything changes. A warm welcome is combined with a lively buzz of conversation – no music, thank goodness, just people having a good time. The long room is attractive, lined with shelves filled with the produce waiting to be cooked in the open kitchen.

Acorn House describes itself as "London's first truly eco-friendly training restaurant" (I don't think there's much competition) and is a charitable venture run by the Shoreditch and Terence Higgins Trusts and Bliss Restaurant Consultancy. The restaurant has some impressive eco credentials for its sourcing, transport and waste management policies. We were particularly interested in the latter.

The restaurant claims to recycle or compost all kitchen waste, return as much packaging as possible to the supplier and use biodegradable takeaway packaging. The latter is good for PR but may not be of much value because the biodegradable packaging is likely to end up in landfill once the consumer has finished with it.

Almost immediately we were delighted to be offered tap water from a jug (no plastic or glass to dispose of), with a choice of filtered still or sparkling. The menu is fairly short, but with a good selection of tasty dishes and some imaginative combinations of ingredients, most of which are seasonal. My starter of smashed broad beans with mozzarella had the zingy flavour of fresh mint whilst a roasted red pepper soup with harissa was subtle and smoky.

Our cuttlefish salad and onglet (steak) with roasted tomato aioli and sweet potato were equally delightful, seasonal and summery and also substantial (different portion sizes are offered for those with small appetites, to reduce waste).

Our plates scraped clean, we asked the manager how the restaurant deals with plate waste. He told us that it goes into a food waste dryer which removes virtually all the liquid, reducing both weight and volume, which should save on collection costs. The dry residue is collected for composting by a specialist contractor.

The restaurant's website describes space for a 'PIG' composter. However, our sources reveal that there is insufficient space for a



© Acorn House

composting machine on site. They also reveal that food waste dryers consume significant amounts of energy (hopefully purchased from renewable sources) because of the heating element.

Uncooked preparation waste from the kitchen goes to a wormery, which is sited in a dedicated storage area, the roof of which is used to grow some vegetables and herbs, though clearly not enough to keep the restaurant fully supplied. There is great excitement amongst the staff when their own produce becomes available for the kitchen.

All cardboard and plastic is recycled. The restaurant averages one bag (not always full) of landfill waste per day. Its website claims that they aim to recycle as much as 80% of their waste, working with partners to test out new waste management strategies in a restaurant environment. This is to be loudly applauded in the light of the significant environmental impacts from food and other waste in the hospitality sector (currently the subject of two national studies with which we are involved).

On the whole, I loved this place, and couldn't fault it. One small suggestion though: perhaps Acorn House would like to update its website, which appears to have been written before they opened in 2006, with lots of aspirations. I suspect that they have now proved themselves and are in a position to trumpet some of their achievements. ■

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Jane Carlton-Smith
Researcher specialising in sustainable procurement in the hospitality sector and based at Oxford Brookes University. Jane has co-authored a number of popular guides on sustainable procurement and catering, and regularly judges awards for responsible business in the hospitality sector.

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How I rate it

Overall: *****

Fairness: *****

Health: *****

Animals: *****

Environment: *****

Taste: *****

Ambience: *****

Value for Money: *****

(maximum five stars)

forthcoming events

5th - 10th Sep '09	British Science Festival British Science Association www.britishsciencefestival.org Surrey, UK
5th - 20th Sep '09	Scottish Food Fortnight Scottish Countryside Alliance Educational Trust www.scottishfoodfortnight.co.uk/ Scotland, UK
9th - 11th Sep '09	States' Extraterritorial Obligations Related to Economic, Social and Cultural Rights Lancaster University www.lancs.ac.uk/universalhumanrights/UnivHRConference.htm Lancaster, UK
12th - 13th Sep '09	Organic Food Festival Soil Association www.soilassociation.org Bristol, UK
14th Sep '09	Annual Water Summit Ethical Corporation Conferences www.ethicalcorp.com/conferences London, UK
16th Sep '09	2nd Annual Ken Hom Lecture - How the British became French: Britain's gastronomic journey 1960 - 2010 Oxford Gastronomica http://oxfordgastronomica.brookes.ac.uk Oxford, UK
19th Sep - 4th Oct '09	British Food Fortnight www.britishfoodfortnight.co.uk UK
23rd - 24th Sep '09	Measuring and Marketing the Environmental Costs and Benefits of Agricultural Practice Association of Applied Biologists www.aab.org.uk Basingstoke, UK
24th Sep '09	Why Are GM Crops So Controversial? SJ Berwin www.sjberwin.com London, UK
5th Oct '09	Annual Sustainable Finance Summit Ethical Corporation Conferences www.ethicalcorp.com/conferences Brussels, Belgium
12th - 14th Oct '09	Africa's 'Engine for Growth' - Plant Science & Biotechnology Hold the Key Association of Applied Biologists www.aab.org.uk Harpenden, UK
16th Oct '09	World Food Day United Nations Food and Agriculture Organisation www.un.org International
21st Oct '09	CCRI Policy Conference 2009: Rural Policy and Local Assets Countryside and Community Research Institute (CCRI) www.ccri.ac.uk Cheltenham, UK
30th Oct - 1st Nov '09	BBC Good Food Show, Scotland BBC www.bbcgoodfoodshow.com Scotland, UK
9th Oct '09	Annual Ethical Supply Chain Europe Summit Ethical Corporation Conferences www.ethicalcorp.com/conferences
9th Nov '09	Community Food Hubs: Exploring Ideas and Practice Food Supply and Distribution strand, Making Local Food Work www.makinglocalfoodwork.co.uk Manchester, UK
10th - 11th Nov '09	Green IT Expo www.greenitexpo.com London, UK
11th - 12th Nov '09	Acrylamide: Influence of Plant Penetics, Agronomy and Food Processing Association of Applied Biologists www.aab.org.uk Harpenden, UK
13th - 15th Nov '09	BBC Good Food Show, London BBC www.bbcgoodfoodshow.com London, UK