



Food packaging

Beyond reduction

A report of the Business Forum
meeting on 20th May 2009

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Introduction

About half of the over 10 million tonnes of packaging that ended up as waste in the UK in 2006 came from food and drink. The Courtauld Commitment between industry and the government-backed waste group WRAP last year stopped further growth in packaging and aims for absolute reductions by 2010. Reducing packaging and using recycled and recyclable materials can cut costs, reduce natural resource depletion, ease pressures on landfill and cut greenhouse gas emissions.

Yet businesses seeking to reduce packaging face an overwhelming array of choices and may question whether, even if they succeed, their actions will be enough. How much packaging is wasted before products reach consumers? Is less always better? Could closed-loop recycling give us green packaging forever? How important to consumers are wider factors such as the visual impact of packaging waste, ethical objections to wastefulness and unease with the industrialisation of food?

The May 2009 meeting of the Food Ethics Council's (FEC) Business Forum discussed such issues. We are very grateful to Mark Barthel, Special Adviser at WRAP, for speaking. The chair was Jeanette Longfield MBE, Co-ordinator of Sustain: the alliance for better food and farming, and a member of the FEC.

This report outlines points raised during the meeting. Contributions are not attributed. The report was prepared by Tom MacMillan. It does not represent the views of the Food Ethics Council, the Business Forum or their members.

Key points

- While **4.7 million** tonnes of food packaging were reported in the UK in 2008, the total is higher, because some packaging falls outside reporting requirements.
- Packaging can often be significantly reduced with no loss of functionality: 750ml wine bottles contain anything between **280g and 1,002g** of glass.
- Small changes can make a big difference: reducing a cereal carton by the size of a **matchbox**, over a million packs, would cut out 18 tonnes of material and take **10 delivery trucks** off the road.
- Around **two-thirds** of UK packaging is recycled.
- New caustic washing processes are bringing us closer to **closed-loop** recycling, allowing recycled material to be used for food-grade packaging.
- Packaging can play an important role in reducing **food waste**, which amounts to 6.7 million tonnes a year in the UK and has a retail value of **£10 billion**.
- Challenges facing efforts to improve packaging include to adopt targets that balance multiple sustainability **indicators** and to tackle packaging waste in **food service**.
- Policies on packaging and waste reduction must be equipped to cope with technological **innovation** or changes in **consumer behaviour** that break from current trends.
- While **government** efforts on packaging focus on win-wins for business and the environment, **the market** cannot be relied upon to provide incentives for green innovation.

Why does packaging matter?

We have a love-hate relationship with packaging. We need some forms of packaging for storing and transporting food – even loose vegetables, for instance, are delivered in crates and carried out in bags. Yet the function of packaging extends far beyond this. It is also a marketing tool. Packaging – or even the deliberate absence of packaging – sells things. It is used to differentiate products, describe them and meet legal requirements on labelling. If you take sales as a yardstick for consumer preferences, most of us seem to find packaging incredibly appealing.

However, for consumers, the relationship has always been bittersweet. After all, what sense does it make for the part of our purchases we do not actually consume to have such a strong bearing on our choices? The trend over recent decades toward single use packaging – plastic instead of glass milk bottles, for instance – has contributed to a wider unease about a ‘throwaway society’. And the visual impact of packaging waste has also long been a cause for public concern.

This may help explain why, as environmental concerns have risen up the agenda, packaging waste has been the focus of so much attention. Packaging – and plastic carrier bags in particular – has been a greater focus of public, political and media attention than their measurable environmental consequences, compared with other priorities, might seem to warrant. The production and disposal of packaging do have important, direct effects on the

environment. It takes energy and scarce natural resources to make packaging, while getting rid of it takes further resources, including land, and causes pollution. Yet there are also trade-offs – better food packaging can mean less food waste, reducing the resource use and disposal problems associated with food itself.

How do we waste?

The Advisory Committee on Packaging estimates that there were nearly 10.8 million tonnes of ‘obligated’ packaging in 2008, of which 5.9 million tonnes entered UK homes and 4.7 million tonnes was food packaging. Businesses that are signed up to the Courtauld Commitment accounted for 3.8 million tonnes of grocery packaging.

‘Obligated’ packaging means the subset of packaging that falls under the government’s packaging reporting requirements. Smaller businesses do not face this requirement. So the total will actually be higher than 10.8 million tonnes but nobody knows by how much.

Data on how consumers use and dispose of packaging and food is increasingly detailed. WRAP has studied this in 3,000 consenting households, and the data in its original ‘The Food we Waste’ report is soon to be updated. The new research includes detailed waste diaries and studies of the composition of food waste. The study is sufficiently fine-grained that it can even tell which flavours of crisp are most likely to be thrown away uneaten.

Whereas research finds a large gap between reported and actual behaviour on many other issues, when it comes to waste people generally report the overall amount they waste fairly accurately. They tend to understate how much expensive food they throw away, but overstate the quantity of cheap items.

Reduce...

WRAP has found that many products offer startling scope to reduce packaging, sometimes yielding major savings and other benefits into the bargain.

The range in existing packaging for similar products illustrates this potential. For example, 750ml wine bottles vary in weight from 280g to 1,002g. The weight of the bottle does not correlate with the price of the wine.

WRAP uses sophisticated technology, including tracking individual bottles in real time using GPS, to help companies identify and test ways of reducing the glass in their bottles without losing functionality. In general, the key to achieving lighter bottles is to ensure an even flow of material within moulds. With Grolsch, the beer manufacturer, WRAP identified a new bottle design that was lighter, embossed (which usually increases the weight of bottles by about 10%) and increased sales.

It is not only bottles that offer scope for reduction. WRAP helped Heinz reengineer their cans, using less steel, saving the company about \$15 million worldwide, and creating a container that was easier to open.

Rethinking plastic ready-meal packets has also yielded major dividends. WRAP found that a brick-shaped pack could reduce the volume of packaging by 40% and reduce cooking times in microwaves. The organisation has also developed stand-up bags, which have been successfully adopted by Asda.

In some cases packaging can be removed altogether. In Australia, for example, organic bananas are differentiated by having their tips dipped in coloured wax instead of packaging them in bags. In New Zealand, which has had a zero-waste strategy for around five years, some supermarkets have no packaged goods, dispensing refills of food and other products from hoppers. An example closer to home comes from Waitrose, which offers multipacks of a snack bound together with sticky tape instead of using an extra bag or box.

Overall, when you include all the different layers of packaging on many food products, even seemingly small reductions add up to make a substantial difference. For example, reducing a cereal carton by the size of a small matchbox would, for a million cereal packs, cut out 18 tonnes of material and take 10 delivery vehicles off the road.

Reuse, recycle

Progress is also being made on packaging reuse and recycling which, with reduction, make up the 'three Rs' at the heart of most efforts to reduce the environmental footprint of packaging.

The latest figures show the UK recycles about two-thirds of packaging. Rates

took a knock in 2008 when the demand for recycled material from emerging markets slowed, but are now picking up again.

It remains unusual to reuse packaging, even glass bottles. However, we are getting closer to 'closed loop' recycling, in which material can be reused for the same purpose rather than being downgraded each time it is recycled. A new 'superwashing' process – a caustic wash that removes tiny amounts of the packaging surface – allows recycled material to be used as food packaging. WRAP's experiments show that this process can even convert non-food grade packaging to food grade. As well as reducing the need for new material, the carbon footprint of food packaging recycled in this way is reduced by about 20%.

Most consumers support recycling and companies that use recycled packaging seek to communicate this to their customers. Yet many people still do not recycle their household packaging waste. WRAP is working with Tesco on automated recycling units that separate materials on site, making it easier for people to recycle, and carry out initial processing such as crushing cans to reduce their volume. The retailer is now experimenting with units that have clear fronts, so kids can see the recycling happen. These recycling systems are costly but increase footfall in the stores that have them.

A further area of innovation is in biodegradable and compostable materials that are, in effect, recycled back into the environment. The archetypal example might be a

toothpaste box that you could simply wash off. In practice we are some way from that, however. In the UK we do not yet have the infrastructure to collect and process the majority of plant-based polymers, which require industrial composting and do not decompose in garden bins. Indeed, currently, the danger is that compostable materials get into traditional recycling streams where they can cause serious disruption.

Joined-up innovation

A key to successful innovation in packaging – reaping benefits for the environment, consumers and businesses – is to consider from the off how consumers will respond to, use and dispose of it.

Computer-aided design technologies now mean that you can brainstorm new packaging ideas in the morning, physically synthesise prototype products over lunch and have narrowed down a handful of products to test with consumer focus groups by the end of the day. So you can get from a product concept on Monday morning to consumer research on Tuesday and have narrowed your options by Wednesday.

Examples of where consumer research and marketing potential has played a key role in packaging reduction include milk and pizza. Sainsbury's and Waitrose now sell milk in plastic pouches, along with refillable jugs that act as branded merchandise. The Iceland chain were unsure how consumers would react if they sold frozen pizzas in plastic, without outer cardboard boxes;

research showed that most discarded the packaging before putting the pizzas in their freezers in any case.

While there are many examples of companies recognising that reduced and recycled packaging can represent a marketing opportunity, the UK has been less successful at seizing the economic opportunities associated with processing packaging materials in more environmentally friendly ways. Many of the technologies discussed in this report, including automated recycling units, are imported to the UK from Scandinavia or Japan. In Scandinavian countries, innovation in recycling systems and the 'green jobs' that go with it have been supported by mandatory deposit systems which generate revenue to pay for investment in recycling infrastructure.

Food waste

A major factor complicating efforts to cut the environmental footprint of food packaging is that reducing packaging can sometimes increase food waste, which can more than offset any gains. Indeed, achieving genuine environmental benefits from reducing, reusing or recycling packaging depends on understanding how any changes will affect labelling, food safety, refrigeration and perishability.

Around 6.7 million tonnes of food waste are generated in UK homes each year, of which around 6 million tonnes go to landfill. Sixty to seventy percent could have been eaten. The retail value of this wasted food is around £10 billion and

rising – that averages at £610 a year for family households. WRAP's research on household waste found that 4.4 million whole apples are wasted each day.

Packaging sizes are one influence on this waste. At present many foods are packaged in amounts that are too large for single-person households, which make up a growing proportion of the UK population.

Labels on packaging can be part of the problem and can contribute to solving it. WRAP is currently working with the Food Standards Agency to clear up public confusion over 'use by' (a food safety label) and 'best before' (a quality label), in an attempt to reduce the volume of edible food that gets needlessly thrown out once it passes its 'best before' date.

WRAP has also found that many consumers do not use fridges as effectively as they could to preserve food. Some keep bread in the fridge, for example, where it goes stale six times faster than at room temperature. Meanwhile fruit and vegetables, which mostly keep for longer refrigerated, are often kept out of the fridge. When people do put fresh produce in the fridge they often remove any packaging, which again decreases shelf-life.

Furthermore, WRAP discovered, we generally do not keep our fridges cool enough. Keeping fridges at the recommended temperature would save around half a million tonnes of waste a year in the UK, which would more than make up for the additional environmental cost of the refrigeration.

Of course, food is not only wasted in the home, but also during manufacture and retail. Even with chilled ready meals, for example, some estimates suggest that, in addition to 20% consumer waste, retailers and manufacturers each waste around 5% of the product. Altogether, around 440,000 ready meals are wasted every day in the UK.

Regulatory requirements sometimes exacerbate food waste in the supply chain. If one egg in a box is broken, retailers discard the full box rather than simply replacing it, because they are not licensed to repack the eggs.

Cuts in food waste can be achieved right along the supply chain by providing consistent, detailed guidance. In processing, for example, WRAP finds that businesses generally underestimate their losses from waste but often act when sources of waste – such as stoppages in production – are highlighted to them. Supermarkets have found that providing in-store guidance on food storage to complement the instructions on packaging influences how people store their food at home.

Ultimately, to achieve major, permanent cuts in the amount of food we waste, we may need to re-educate ourselves about food and change our relationship with it more profoundly. Instructions on packets are no substitute for experience and understanding. We need to place a higher value on food and be comfortable preparing it.

Gaps

The relationship with food waste seriously complicates efforts to make packaging better for the environment. The challenge is made tougher still by a number of gaps in current thinking on this problem.

The first relates to targets on packaging waste. Until now many – including those in the original Courtauld Commitment – have focused on reducing the weight of packaging. But weight is not an intelligent indicator: in coffee, for instance, it has helped to justify a move away from glass to non-recyclable plastic jars.

The UK is now moving to carbon-based targets for packaging waste. This is less likely to have unintended environmental consequences, yet it is far from perfect. Not only do carbon targets fail to take account of other environmental indicators, but they also ignore social issues in sustainable development such as livelihoods and jobs. So we urgently need a balanced range of indicators.

A second, related, gap is in understanding and addressing the direct environmental problems, besides climate change, associated with producing specific types of packaging. The dyes, inks, bleaches and coatings used in printing packaging, for example, can be damaging to the environment. Only a few food companies have got as far as trying to address this.

A third gap is catering, or food service. In common with many other sustainable development issues, the focus of policy and public attention to food packaging

has been on products sold through supermarkets. The food service sector has a similar turnover to food retail, but is more complex and diverse in structure, including a large number of small and medium-sized businesses that have evolved their own ways of operating. Work on food service is currently focused on understanding the scale of the problem. Estimates of waste from food service range from three to nine million tonnes a year.

Future proofing

Even if such gaps were addressed, would the UK's approach to addressing the twin problems of food and packaging waste be bold enough? Is there a risk that an approach that is so heavily focused on achieving incremental reductions and improvements in recycling commits us to sustainability goals that will at best be too little, too late? Indeed, by concentrating investment on the infrastructure, skills and research needed to achieve these incremental improvements, are we failing to explore or prepare for innovations that could radically change the relationship between packaging, waste and the environment?

One area where new technology might challenge current policies on packaging – with regards to waste and food safety – is nanotechnology. One company, for example, has developed an edible nanocoating that, sprayed onto fruit, stalls ripening and increases shelf-life. It offers many of the benefits of packaging but uses very little material and is convenient for consumers. As the

coating decomposes into the environment, it is an example of so called 'cradle-to-cradle' technology.

The challenge facing nanotechnology is to demonstrate that the exciting and sometimes unpredictable properties that particles acquire when they are very small do not render them unsafe. For instance, WRAP found that including nanoparticles of clay in packaging films put fruit into stasis, radically prolonging shelf-life, but as they could not explain the phenomenon they could not exploit it, because of the risk of unintended consequences.

Of course, technology is not the only 'wild card' in the future of packaging and food waste. Another is consumer behaviour. A major shift towards convenience shopping for fresh and chilled produce, which might be influenced by factors as diverse as working hours, planning rules and public transport, might radically reduce the need for both packaging and refrigeration in the home. Remembering how recently fridges, supermarkets and ready-meals became part of daily life can help ensure policies are open to new possibilities and resilient to unexpected events.

Incentives and limits

Much of the debate and government effort on food packaging focuses on helping businesses seize win-wins, where they can make a saving or boost sales by improving their environmental performance. As we have seen, the relationship with food waste, the gaps

within current approaches and the need to prepare for the unexpected all complicate the task of identifying win-wins, but they do not fundamentally change it.

In closing, however, it is worth noting that the market often cannot be relied upon to provide incentives for environmentally friendly innovation. For a start, other factors than the cost of materials and potential appeal to consumers influence packaging. In the USA, for example, food packaging is reported to be increasing to accommodate the ever-more detailed labels and instructions manufacturers feel they need to include in order to mitigate the risk of litigation in the event of any problem.

In the UK, meanwhile, manufacturers who have sought to reduce packaging on their own products have been frustrated to see their efforts cancelled out by increases in the shelf-ready packaging demanded by the supermarkets they sell to. Shelf-ready packaging allows the supermarkets to reduce staff and therefore represents a major saving for them. Here, again, commercial pressures hold back environmental gains rather than supporting them.

Consumers face similar constraints. While many support recycling and waste

reduction initiatives, and feel they have a duty to do their bit, the actual carrots and sticks in place to encourage such behaviour are minimal. Recycling campaigns are asking people to do something that is economically irrational: voluntarily to invest time and effort in solving a shared problem in the knowledge that some other people will be getting a free ride by not doing their bit.

So should government do more, introducing further incentives and rules to help align the marketplace with efforts to reduce waste and encourage recycling? Probably, and perhaps it will. But there are vested interests in stopping it. When Defra floated the idea of mandatory recycling, for example, it faced heavy lobbying from the packaging industry, which profits from single-trip packaging.

Indeed, even the food businesses leading efforts to reduce waste within their own operations and supply chains have little incentive to support measures that would cut consumer food waste. The bottom line is that a 10% cut in food waste would, if reflected in a 10% cut in consumer purchasing, decimate their industry.

Speaker biographies



Jeanette Longfield MBE is Co-ordinator of Sustain: the alliance for better food and farming, a network of around 100 national organisations formed from the National Food Alliance (which she joined in 1992) and the Sustainable Agriculture Food and Environment Alliance. She has also worked as a Policy Analyst at the NCVO, and for the Coronary Prevention Group. Her publications include A guide to preventing heart disease for Which?, and numerous articles in food, health and consumer magazines. She was a member of the Royal Society Inquiry into Infectious Diseases in Livestock commissioned by the Government following the Foot and Mouth Disease outbreak. As Sustain's Co-ordinator, Jeanette liaises with the Food Standards Agency, contributes to a number of food policy committees, and appears regularly in the media representing a public interest view on food policy issues. She is a member of the Food Ethics Council.



Mark Barthel is Special Adviser at WRAP (the Waste & Resources Action Programme). He has had a varied career starting with over 10 year's foreign exchange and commodities trading and anti-fraud experience in London, New York and Hong Kong; followed by almost 15 years working on corporate sustainability issues, eco-innovation and government policy formulation and delivery. Mark is a policy adviser to the Cabinet Office, Defra, DECC and the devolved administrations; and provides strategic support to the sustainability / corporate responsibility, product design and packaging teams at Asda, Sainsbury's, M&S, Morrison's, Nestlé UK, Cadbury's, Mars and Duchy Originals. Mark is also a Trustee to the Forest Stewardship Council, a Fellow at the University of Southampton Centre for Environmental Science, a visiting lecturer in sustainable design at the RCA and a member of the Steering Board of the Centre for Sustainable Design. He is also a former part-time Special Advisor to the UN Framework Convention on Climate Change; and led the development of the first international (ISO) standards on greenhouse gas measurement, inventory development, data validation and verification.

About the Business Forum

Ethical questions around climate change, obesity and new technologies are becoming core concerns for food businesses. We have launched the Business Forum to help senior executives gain expert insights into the big issues of the day. Membership is by invitation only and is strictly limited.

The Business Forum meets six times a year for in-depth discussion over an early dinner at a celebrated London restaurant. The forum members shape the meeting agenda.

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