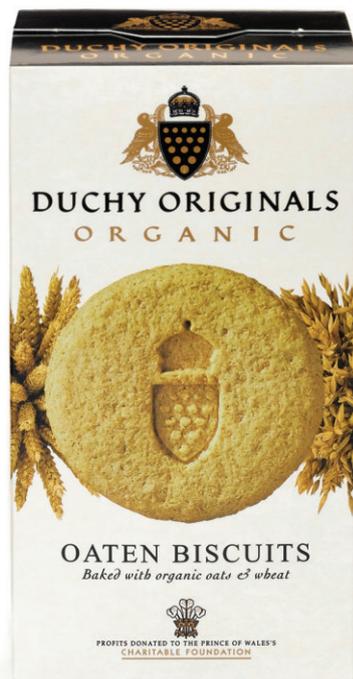


Case study

Cardboard packaging optimisation: best practice techniques

Effective re-engineering of carton and corrugated cardboard packaging cuts costs and waste while retaining brand benefits and consumer appeal.



Some recent research can serve as best practice for manufacturers, retailers and pack designers wishing to go down the route of packaging optimisation. This case study focuses on the benefits of optimising cartonboard and corrugated packaging.

The UK consumes more than 12.5 million tonnes of paper a year. Over 3.7 million tonnes of this consists of paper packaging, including cartonboard (743,000 tonnes) and corrugated cardboard (2,377,000 tonnes). With 100% virgin material this equates to 2,898,000 and 9,270,000 tonnes of Carbon Dioxide (CO₂) equivalent respectively.

The paper accounts for as much as one-third of the waste thrown away by the average UK household, so optimisation offers great potential for reducing waste and Green House Gas (GHG) emissions. Other benefits include creating consumer appeal, increasing brand equity and saving costs.

Key facts

- The UK consumes more than 12.5 million tonnes of paper a year.
- Duchy Originals trial achieved an 11% reduction in their biscuit cartons.
- The Co-operative Group branded tomato puree trial led to a net reduction of 1.8 tonnes of packaging in a year.
- 333 million boxed pizzas are sold in the UK each year, frozen pizza is a key area for packaging optimisation.
- Sheepdrove Farm reduced packaging by 7 tonnes in a year, equivalent to a 23% reduction.
- Kite saved 36 tonnes of corrugate in a year, equivalent to a drop of 30% in carbon emissions from fewer road trips.

But re-designing or optimising packaging involves a great deal more than simply making technical changes or packaging processes. In most cases, a total packaging solution will be called for, involving primary, secondary and tertiary pack functions, plus merchandising and on-pack messaging to the consumer. Trials may also have to be held to test customer perception and acceptance of the new packaging.

Cartonboard

WRAP has supported a number of innovative projects aimed at optimising cartonboard packaging in the grocery sector. Some involved radical changes and others were step changes all of which deliver considerable reductions in household packaging waste.

Duchy biscuit cartons

Duchy Originals is one of the UK's leading premium organic food brands. In a pilot project, Duchy worked with its biscuit maker, Walker's Shortbread, to make significant packaging weight savings through relatively small changes to its biscuit cartons.

The new pack had a thinner gauge of cartonboard, and the size of the glue flaps on the ends of the pack was reduced. Overall the changes produced an 11% reduction saving, without affecting the strength of the packs. The new packaging has been well received by customers and Duchy Originals is planning to replicate the work across other products in its range.

"This is an excellent example of how a small, incremental change can lead to significant savings; the industry should constantly be looking to make such changes as part of their normal packaging reviews. In this particular case, an added benefit of the pack change is the fact that it enhances the environmental credentials of the product, which is particularly important for organic products."

Helen Hughes, Packaging Designer, WRAP.

Co-op tomato puree – a total packaging solution

WRAP sponsored a project to reduce external packaging from the Co-operative Group branded tomato puree. The aim was to demonstrate functional methods for reducing household packaging that can be replicated by other manufacturers, for example on toothpaste. What was required in this case was a total packaging solution, plus merchandising and messaging on-pack to the consumer. The tubes were supplied in corrugated board shelf ready packaging placed directly on the supermarket shelves, with no cardboard box packaging.

Saleability

A crucial part of the trial was to identify the commercial impact of removing the external box and to provide market support to ensure that the product remained attractive to the purchaser.

The project included:

- design works on both the tube and the shelf ready packaging to provide a more robust product;
- artwork and reprographics to ensure that the product remained attractive to the consumer; and
- sales monitoring to monitor sales of the newly packaged product.

Consumer perception

The tomato puree's overall growth in sales suggests that customers have not had any concerns over the new packaging and appear to welcome the new minimised packaging. This change in format, including the addition of the retail ready on shelf units led to a net reduction of 1.8 tonnes of packaging in a full year.



Iceland frozen pizza flow wrap trials

With around 333 million boxed frozen pizzas sold in the UK each year, frozen pizza is a key area for potential package optimisation. And as a major supplier of frozen food, Iceland was well placed to test packaging innovations in this sector. Iceland's pizzas currently account for over 591 tonnes of packaging a year; if the outer cardboard boxes and cling-film inner wrap could be removed this amount would reduce by half.

The aim was not only to reduce the amount of packaging used in the pizza packs, but to deliver a customer-focused benefit by reducing the freezer space required for storing the product. This is an important issue for consumers who struggle to fit large pizza boxes into their freezers. The challenge was to come up with a lighter weight packaging solution without sacrificing any of the product qualities, and without the consumer having to pay more.

Consumer research was carried out with Iceland customers currently purchasing within the frozen pizza market. Based on the results, three final concepts were developed and taken forward.

Benefits to business

The new packaging delivered an estimated 69% cartonboard saving (reducing the weight of packaging per pizza from 74 to 23g), with no increase to packaging costs and it maintained consumer appeal.



This project has highlighted many new options for achieving packaging reductions in the area of frozen pizza and potentially other key frozen categories.

Corrugated – smaller and lighter

Several projects aimed at streamlining and optimising corrugated packaging have been supported by WRAP and the findings are summarised below.

Corrugated paper accounts for 64% of all packaging paper consumed in the UK. This amounts to 2.2 million tonnes of corrugated boxes, once account has been taken for wastage in the manufacturing process and the addition of adhesives. This figure does not include the corrugated boxes used to import goods into the country. When these are taken into account, the total weight of corrugated packaging entering the waste stream is approximately 3 million tonnes a year. There is clearly great potential to reduce this figure by optimising corrugated packaging of all kinds.

Sheepdrove Organic Farm

Sheepdrove Farm uses returnable corrugated cardboard boxes for its mail order meat business. Previously all orders were sent out in a standard size box, whatever their weight. As an organic producer the farm wanted to keep its packaging to a minimum. It made a simple but very effective change by providing two new optimised sizes of corrugated cardboard carton depending on the weight of the order. The original box is now used only for



orders over 10kg. The farm is now looking at ways to increase the recycled content of its packaging and the number of boxes that are returned for reuse. Sheepdrove's move is an excellent example of how effective an apparently small change can be in achieving a substantial material reduction, while achieving positive customer benefits.

Customers like the smaller sizes and the new flexibility has reduced the farm's packaging by around 7 tonnes per year, equivalent to a 23% reduction.

Kite project

Packaging distributor Kite Packaging Ltd investigated whether a change to a lighter-weight single-wall corrugated cardboard carton could be achieved without sacrificing the strength of the original carton. They also reduced the amount of space in their warehouses taken up by the cartons which improved logistical efficiencies, saved money and reduced the amount of cardboard householders throw away. For this project, the focus was on stock cartons, which are typically used in bulk by fulfilment houses, logistics companies, internet-based companies and retailers to deliver products direct to the home user. These account for a large percentage of the corrugated packaging consumed in the UK each year.

Lightweighting

Stock cartons are made from two types of board: double-wall flute board and single-wall flute board. Double-wall flute cartons are bulkier than single-wall ones and are generally used for heavier or fragile products. A single-wall alternative that was just as strong as double-wall would take up less space during storage and transport, resulting in corresponding cost savings, and reductions in the amount of cardboard entering the waste stream.

After extensive strength tests, Kite came up with a range of new lighter-weight cartons branded the 'Enviro-box'. The new cartons weighed less but were of similar strength to the current double wall cartons.

Customer trials

Kite enlisted its customers, including toy chain Toys R Us, to carry out initial packing and transit trials of the cartons. Overall, customer feedback was very positive.

Benefits to business

- This project will save Kite 36 tonnes of corrugated cardboard per year, if taken up by all their customers. This equates to a reduction of 25 tonnes of cardboard entering the household waste stream.
- Carbon emissions from transport drop 30% because fewer road trips are needed to transport the cartons from manufacturer to distributor. [Source: survey carried out for Kite by ARUP].
- If the Enviro-box was adopted across the industry, an estimated UK-wide saving of 3,600 tonnes per year could be achieved. This would reduce carbon emissions by 4,700 tonnes – equivalent to taking 1,500 cars off the road for a year.

The way forward

All of these innovations can be replicated widely across the sector.

The packaging innovations featured here vary in terms of their detail; some involve wide ranging and radical changes necessitating research, experimental work and design input, and re-brands of the products in question. Others are as simple as using a smaller or thinner box for a product. All can lead to material and cost savings and enhancement of brand perception.

Paper and board checklist:

- consider reduce, reuse, recycle;
- identify the most suitable lightest weight board;
- check weight against Best in Class and competition;
- ensure overlap on flaps is as small as gluing lines will allow;
- use mechanical locking instead of adhesives or staples to help recycling;
- check proof of origin from sustainable sources; and
- use corrugated board instead of expanded polystyrene for delicate items.

More details on all of the above projects, including full technical reports, are available from www.wrap.org.uk/retail.

For more information, or technical advice, contact the retail team at WRAP on 01295 819686 or email retail@wrap.org.uk

WRAP works with retailers and their supply chains to reduce the amount of packaging and food that households throw away.

Keep up to date, keep informed and register for a newsletter. www.wrap.org.uk/retail/news_events

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