



The ultimate guide

Preventing food waste in the manufacturing sector

Reduce your costs.
Tackle climate change.
Be responsible.



EUROPE & SCOTLAND
European Regional Development Fund
Investing in a Smart, Sustainable and Inclusive Future



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We can help you prevent food waste

If you're a food and drink business, we can help you prevent unnecessary food waste.
Call 01786 433 930 or email food.drink@zerowastescotland.org.uk and ask about our free food and drink opportunity assessments.

www.zerowastescotland.org.uk/FoodDrink



Introduction

If your business is producing too much waste, then it's costing you money and contributing to a global problem. This guide is here to help tackle the issue.

988,000 tonnes of food and drink was wasted in Scotland in 2013 with 25% coming from food and drink manufacturing businesses¹. Decisions made at every point in our food supply chain, from the farm to our plate, affect how and where food and drink waste occurs. The food manufacturing and processing industry therefore has an important part to play in reducing food waste.

This means the industry has a key role to play in tackling climate change. That's because food waste often ends up in landfill where it breaks down into one of the most damaging of all greenhouse gases – methane. Food also uses a lot of fossil fuels – through the pesticides used to grow it, the machinery used to farm it and its transportation around the world.

If you take action to minimise food waste then you'll also be taking action to save your business money. Your waste disposal bills could shrink significantly, and you'll save the cost of buying raw materials that you're then wasting. You'll also be saving the other resources that went into growing that food, including copious amounts of precious water, and the valuable nutrients the food pulled from the soil.

This guide sets out how you can start to reduce food waste, and to identify value in your residual unavoidable waste. As well as minimising your costs, you might discover that what you've been regarding as waste could actually be a winning business opportunity.

But if you need more help, or a more detailed assessment of opportunities for saving waste in your business, call us 01786 433 930 or email food.drink@zerowastescotland.org.uk and ask about our free food and drink opportunity assessments.

¹The Scottish Government (2018) Food Waste Reduction Action Plan. Available at: <https://www.zerowastescotland.org.uk/sites/default/files/Food%20Waste%20Reduction%20Action%20Plan.pdf>



Optimising your processes

The first step to reducing waste and costs is to look carefully at your processes, and refine them where you can.

You might think you know your business well but it can take a more detailed look and a fresh perspective to really see how well your processes are working. It's a little like looking at an optical illusion where your eye can't see it at first, and then it just seems so obvious.

Your processes include all your company procedures as well as your manufacturing methods. The first step to optimising them is to undertake a comprehensive review. This will throw a spotlight on issues and problem areas. You can then develop new ways of doing things that maximise efficiencies and minimise waste and costs.

Process optimisation is all about making your business more effective. The focus on reducing waste and costs shouldn't compromise your business needs or disrupt

its core outputs. Instead, you should gain a greater understanding of your business. A full review should look at your business inputs and outputs, taking a detailed look at your technical, manual and automated processes. The result will be an overall process map of your organisation, which takes into account and identifies all the variables along the way.

Think of this review as a big piece of research. You'll need to talk to employees, especially the operators, and potentially your supply chain. But the work is usually worth it. It's a great way to find out where processes are, or aren't, adding value; what area of your business is consuming the most resources; and where waste is being produced (for example, through offcuts, spoilage and rejects).

Read on for the three stages of process optimisation...

Did you know?

Food waste generated in the food and drink manufacturing sector costs businesses an estimated £1241 per tonne².

² WRAP (2016) Qualification of Food Surplus and Waste. Available at: <http://www.wrap.org.uk/system/files/private/WRAP%20Quantification%20of%20food%20surplus%20and%20waste%20-%20May%202016%20Final%20Report%20v2.pdf> with inflationary increases derived from PRODCOM 2017 data

The background of the slide is a photograph of a bookshelf. The books are arranged in rows, with green books on the left and yellow books on the right. A large, semi-circular teal shape is overlaid on the left side of the image, containing the title text.

Optimising your processes: three stages



#1 Identify areas of waste

Food manufacturing is producing ever-increasing volumes of waste, but many businesses are still not measuring the waste they produce.

Or they're only measuring the total waste produced instead of identifying where in the business the waste is coming from (whether by department or by process). To identify waste hot spots, and to see where improvements could be made, you need to implement a monitoring and measurement plan at process level (see our [Monitoring and Measurement Guide](#) for more detail). This might involve:

Installation

Installing containers and waste-weighing equipment at specific process areas.

Processes and equipment

Studying processes and equipment in isolation to identify specific areas of waste generation.

Inspections

Conducting visual inspections or using existing employee checks to identify areas of increased waste generation.

Reviews

Reviewing any existing data relating to quality fails, process rework and so on.



#2 Implement improvements

There are several ways to begin optimising processes for waste reduction.

Eliminate unnecessary processes

If you see that a process is repetitive or unnecessary, then ditch it. It's a no-brainer to get rid of a process that's not needed, particularly if it's associated with high costs and high levels of waste. Or perhaps you can incorporate it into another part of your operations. For example, a pre-prepared product could be used to reduce waste and costs at the preparation stage. This could work with pre-prepared vegetables or dough if the waste cost outweighs the cost of any additional raw material. Think of it as lean management with a focus on waste prevention.

Improve your inputs

Sometimes waste can be attributed to a specific process but the process is not at fault. Instead, the waste is the result of other issues. For example, the proofing

process in a bakery may be producing waste but actually the problem is the quality of the dough coming from the kneading or dough preparation stage.

Waste being produced at the cutting and chopping stage may be due to inadequate quality checks on raw materials. You might find you can make quicker, more cost-effective changes earlier within the production process, and without the need for more complicated line changes, simply by reviewing the quality of your inputs.

Train your staff

Before embarking on process upgrades or equipment changes, ensure your staff are properly trained and operating machinery correctly. The newest, most efficient equipment can be rendered inefficient if people are not using it properly.

#2 Implement improvements

Minimise or transfer losses

Some waste, if captured early enough, can be re-processed. Cuttings and quality failures can be reworked as the ingredient of another product. If you can transfer losses to other areas of your business, it ultimately retains the value of a product within your business while reducing waste costs.

Redesign the process or upgrade equipment

If you can't eliminate a process, or improve it, then you should look at the impact of upgrading or re-designing your equipment. Consider newer technologies, moving to more automated processes, or upgrading particular elements of your existing equipment – for example, upgrading software drivers or installing windows or doors to enable employees to visually follow a process. Upgrading or

re-designing equipment can be costly but it could result in significant payback and quality improvements.

Improve outputs or re-design products

Modifying an output or end product can make a process significantly more efficient. For example, a cutting machine might produce less waste by cutting square products instead of circles. Or a cooking process might become more efficient by altering the batch-loads.

Changing your product might be difficult if you have a well-established brand that's known for being a particular size or shape, or has a special flavour. However, if market research is supportive, and you have a good re-branding strategy, you might have a valuable opportunity to save significantly on costs.





#3 Turn your waste stream into an income stream

Sometimes waste is unavoidable but that doesn't mean it's not valuable.

You could potentially use it to generate new revenue streams. Just thinking differently, forging new collaborations with other businesses or making use of new technologies can present high-value opportunities for your waste. For example:

Value in leftovers and rejects

Leftover products (such as unsold or unshipped material), quality failures and scrapings could be more valuable than you think. For example, broken biscuits can be crumbed and added to the ingredient mix of new batches. Misshapen dough can be reworked. Mis-packaged product or end of line stock can be sold at a discounted price. Excess cooking fats and stock can be reused within other recipes to add flavour.

Becoming part of the circular economy

The traditional linear economy model takes resources, uses them then disposes of them. A circular economy model keeps resources in use for as long as possible. In recent years, companies have been establishing innovative circular economy business models, many of which make use of food or liquid by-products that would otherwise go to waste. Examples include making beer from excess bread, making vodka from waste potatoes or making croutons from surplus bread. Manufacturing new product lines from waste streams has the potential to generate new income streams and diversify the business.

#3 Turn your waste stream into an income stream



Value in the bioeconomy

The bioeconomy comprises those parts of the economy that use renewable biological resources from land and sea – such as crops, forests, fish, animals and micro-organisms – to produce food, materials and energy.

Anaerobic digestion is preferable to disposal of bio-waste to soil or landfill, where it can cause serious environmental problems, but is still not the optimal solution. Developing value-added processes for such resources has a positive impact beyond the boundaries of your business.

Recovering the soluble sugars, fibre, whey and protein-based substance from surplus food can generate a raw material for new products that would otherwise be wasted. You might be able to process the by-products from your process yourself and provide it as a raw material

for another business. On the other hand you might be interested in making use of by-products internally. [See the report on the Biorefining Potential for Scotland for more information.](#)

Value in redistribution

If you can't generate new revenue from your food waste, consider redistributing it. Charities such as [FareShare](#) will collect suitable food for redistribution to those in need. This includes food that won't make it for sale due to packaging or manufacturing errors, quality failure, seasonal time limits or excess stock. Read our [Food Waste Redistribution Guide](#) for more information.

Animal feed manufacturers, such as SugaRich, collect larger, consistent quantities of high-sugar content food waste such as biscuits, bread, cakes, confectionary and breakfast cereal to feed to livestock. This is another

alternative to sending food to landfill or anaerobic digestion.

Redistributing food is an ethical thing to do. It benefits people who need it the most and demonstrates good corporate responsibility. As such, it can be great PR and a great message to give your customers. Disposing of food in landfill or anaerobic digestion should always be a last resort.



Inspirational tales

Here are just a few successful businesses in Scotland profiting from their clever use of waste

Breadshare

Proving that old bread can still make a profit

Breadshare, a community bakery based in Edinburgh, has created a new revenue stream by turning unsold sourdough bread into breadcrumb product for sale in its shops and through their wholesalers.



Jaw Brew and Aulds Bakery

Using brewing magic to turn bread into beer

Jaw Brew in Glasgow recently teamed up with Aulds Bakery to produce a low alcohol blonde beer, Hardtack, from surplus unsold morning rolls – a first for the Scottish craft beer scene.



Ogilvy Spirits

Top quality vodka from low-grade potatoes

A few years ago, the family run Ogilvy Farm in Angus wondered what to do with their unwanted, low-grade potatoes. Now they use them to make the top quality Ogilvy Vodka at their on-site distillery. A lovely example of circular economy thinking.



Pennotec

From crustacean shells to cosmetics and more

Seafood produces its own particular type of waste. Pennotec in Edinburgh is extracting chitin from crustacean shell waste. Chitin is a sustainable natural resource that is under-used commercially but can create a strong composite material with bacteriostatic properties. It can be used in cosmetics, surgical stitches, and as a food-thickening agent.



Swannay Brewery

Preventing spillage waste while feeding cows

The Orkney brewery was losing more than 5,000 litres of beer a year during the casking process, which involved filling casks manually by hose. Installing a cask racker has saved the brewery almost £10,000 a year. When the casks are emptied the last swills of beer are added as a nutritious extra to local cattle feed.



Zero Waste Scotland offers all businesses help not only to prevent food waste but to save money, tackle climate change and to show customers that you care.

We're here to help.

Call us on 01786 433 930

Email food.drink@zerowastescotland.org.uk

Visit www.zerowastescotland.org.uk/FoodDrink



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