



Food Waste Challenge

Food Innovation and Sustainability Project



About

Food and Drink is a key industry in Scotland and is home to some of the best produce in the world. World class innovation in agriculture and food production, and a strong entrepreneurial spirit, with a plethora of young and growing businesses working in the sector.

Sustainability and the reduction of food waste is a hot topic at the moment. The UK wastes almost 10 million tonnes of food every year. Almost 2 million tonnes of this come from the food industry, and currently less than 1% is recycled for human consumption.

[DYW Dundee & Angus](#), in partnership with the [Food and Drink Federation Scotland](#), [Zero Waste Scotland](#) and the [Food & Drink team at Abertay University](#) developed a project for secondary schools (S1, S2 and S3) to look at food waste in a real-life context. This will highlight careers in food & drink around science, sustainability and production.



Food and Drink Industry

What is it?

The food and drink industry is very important to Scotland and is the **largest** manufacturing sector in the UK. It creates **jobs** and **wealth**, impacts on **health** and **sustainability**, and helps attract people to the country.

Making a 100 to 1M products to sell at retail?
Then that's the food and drink industry.

In 2019 our industry employed over

440,000 people



across every region
and nation of the UK

FDF members reported an **absolute reduction of**

55.5%

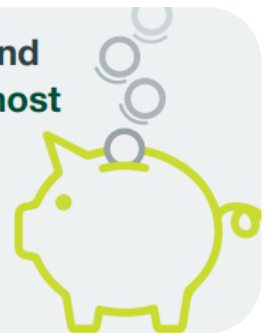
in CO₂ emissions

from their use of energy in manufacturing operations in 2019, compared to the 1990 baseline



Manufactured food and drink contributed almost

£29bn to the economy



fdf food & drink federation
passionate about food & drink

Tasty Careers is a fantastic website that is all about careers in the food and drink industry. Either as a class or individually you can go through the website to find out about **over 100 jobs** in the food and drink industry!

Click the logo here to take you there!



Scotland's Food Waste Reduction Action Plan

What is Scotland's action plan?

Scotland has a target to reduce the amount of food waste produced by a **third** (33%) by **2025**.



Why do we need a food waste reduction plan?

Scotland has a food waste problem. When food is wasted it means that energy and resources that went into producing, processing, transporting and cooking it are also all wasted.

Money spent on all of this is also lost.

In addition to this, if food waste then ends up in landfill, it produces even more emissions in the form of methane gas. Methane is even more harmful to the environment than carbon dioxide.

Food waste that we lose to landfill is a loss of valuable resources, for example; energy, fuel or for fertiliser.

Activity

As a class, to learn more about Scotland's food waste reduction plan, click onto the link and complete the blank statements.

Food Waste
Reduction
Action Plan

Scotland's Food Waste Reduction Action Plan - Practise

Follow the link to the Food Waste Action Plan and fill in the blank statements below from the section titled 'Executive Summary'

Food waste is a global problem. An estimated _____ tonnes of food are wasted every year. This is around one third of all that is produced for human consumption, and it is generating about ____ of the world's greenhouse gas emissions.

In 2014 Scottish households threw away around _____ tonnes of food and drink waste.

Scotland is addressing its food waste problem with this ambitious Action Plan designed to: _____ unnecessary demand for food; improve how we _____, _____ and _____ food so that we waste less; increase _____ and; make better use of food waste as an organic resource.

Food is an important part of Scotland's identity and of our economy. By valuing our food and wasting less of it, we can help to _____, boost the Scottish _____, strengthen _____, and help make Scotland a healthier nation.

The Scottish food and drink industry will show _____ and drive _____ to reduce waste throughout the supply chain.

We will make this change possible and reach our 33% reduction target by working across four vital and interconnected areas.

1. _____
2. _____
3. _____
4. _____

Food Industry and Food Waste

The food and drink manufacturing sector and retail supply chain play a **key role** in food waste reduction.

It is estimated that food waste generated in the food and drink manufacturing sector costs businesses an estimated **£950 per tonne**.

It is therefore vital that the food and drink sector make improvements in order to help achieve the Scottish Government's target to reduce food waste in Scotland by 33% by 2025.

Managing food waste can help businesses to limit their **environmental impact** and improve their **resources** and **cost efficiencies**.



To help you with the challenge of manufacturers producing waste, click on the Zero Waste Scotland logo to look at the guide of **preventing food waste in the manufacturing sector**.



Why does the industry need plastic?

Packaging plays a major role in preventing food waste and managing sustainability across food manufacturing supply chains.



The food and drink manufacturing industry use plastic packaging as it is one of the most effective ways of protecting and preserving a product.

The [Food and Drink Federation Scotland](#) state there are many factors which influence the **use, choice** and **format** of packaging. These include **cost, intended use, suitability** of materials available, and **legislation**, as well as:

Environmental (recyclability, potential for littering at end of life)

Commercial (avoiding waste of product and therefore cost, fulfilling consumer demand)

Technical (barrier properties, flexibility, temperature-resistance, and other unique properties)

Policy (Government policy to promote “light-weighting” of packaging drove the adoption of light, flexible plastics)

Why does the industry need plastic?

[Plastics in our everyday lives \(2.30min\)](#)

Above is a link to a short video on **how plastic is affecting the environment**. However, plastic packaging is **not the main issue** when it comes to food sustainability.

Below is a link to a website which explains the reasons behind using plastic in food packaging. Explore this website as a class to find out why we need plastic packaging.

[Why do we need plastic packaging?](#)

It is clear that plastic serves many important functions to us as consumers and the food and drink industry. One important factor of why plastic is used is because it can be **recycled**. However, determining what can and cannot be recycled can pose a challenge.

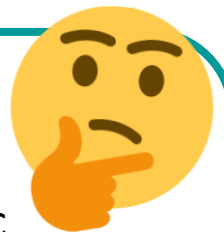
[Recycling labels – what do they mean? \(1 min\)](#)



Activity

Watch the video **below** on how to recycle plastic packaging. Instructions can be found on the following page and can be printed off or completed as a class.

How to recycle plastic packaging



Why does the food and drink industry need plastic?

Follow the link to the video to play 'how do I recycle this'. Watch along with the video and PAUSE at every item of plastic. Then using your knowledge answer the following:

- can it be recycled? YES/NO (circle)
- If yes HOW do you recycle it (Explain)

- 1) Item _____ YES NO Explain _____
- 2) Item _____ YES NO Explain _____
- 3) Item _____ YES NO Explain _____
- 4) Item _____ YES NO Explain _____
- 5) Item _____ YES NO Explain _____
- 6) Item _____ YES NO Explain _____
- 7) Item _____ YES NO Explain _____
- 8) Item _____ YES NO Explain _____
- 9) Item _____ YES NO Explain _____
- 10) Item _____ YES NO Explain _____
- 11) Item _____ YES NO Explain _____
- 12) Item _____ YES NO Explain _____
- 13) Item _____ YES NO Explain _____
- 14) Item _____ YES NO Explain _____
- 15) Item _____ YES NO Explain _____
- 16) Item _____ YES NO Explain _____

How many points did you get? 😊

Your School – Mini Challenge

As a class or in groups can you think of any ways that **your school** may contribute to food waste?

An example could be that your school produces large volumes of food that remains uneaten and therefore goes to waste or that your school produces large quantities of food scraps.



Either as a class or in groups come up with at least **3 ways** that your school could reduce food waste.

[Click here for a video on how to compost at home or at your school!](#)



Waste at Home – Mini Challenge

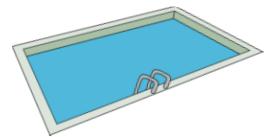
Avoidable household food waste in Scotland would fill:

5,459,770 bins

36,190 bin lorries

362 km bin lorries lined up (equivalent driving Glasgow to Fort William and back)

524 Commonwealth Games / Olympic sized swimming pools



What do you think are some of the most common food items that are thrown into the bin? In pairs or small groups make a list of at least **5 food products** you may throw out at home



After you have created a list of food items that go to waste, in your pairs or small groups think of at least **3 ways** that you could **reduce/prevent food waste at home**

Examples can be found on the [Love Food Hate Waste](#) website, which provides details on why to save food, how to save food, and recipes that use up leftover food!

[Click here for a video on Food Waste Recycling tips](#)

[A website on how can I cut food waste at home?](#)

Food Waste - A Global Issue

Food waste is a global issue with various solutions. Every country comes with different cultures, infrastructures, challenges and opportunities.

This means that every country may have to tackle food waste differently, depending on what works best for them as a country. If every country plays their part in the effort to reduce food waste, food waste will become less of a global issue.

[Video on the United Nations Food Systems \(2min\)](#)

[Video on Food Waste causes Climate Change \(10mins\)](#)

Numerous countries are finding highly effective approaches to reduce their food waste. Examples are;

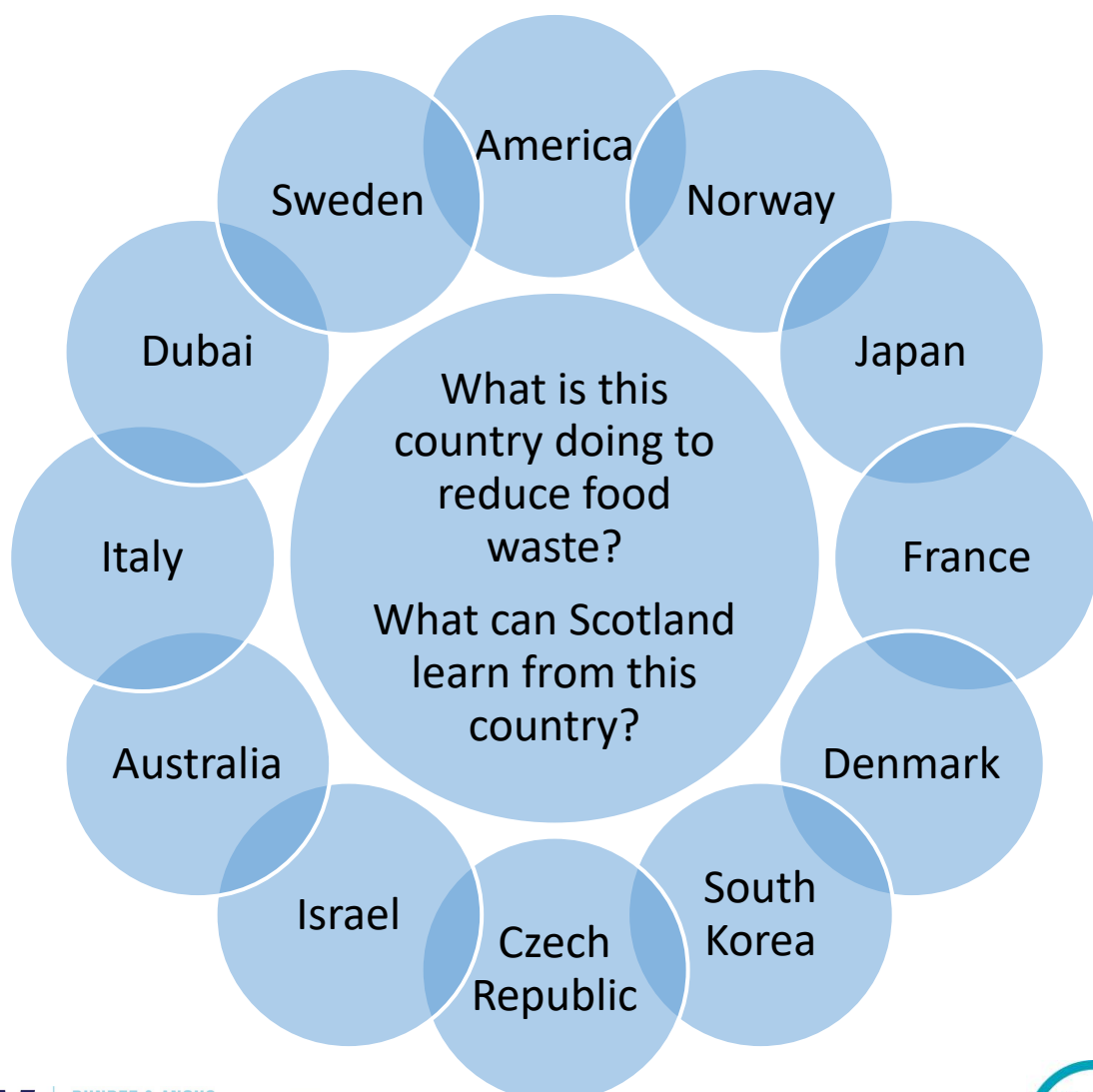
France made it a law that grocery stores must donate edible food instead of throwing it out.

Japan is focusing on education, from primary school up to university, in an effort to change the national understanding of the problem, and raise the next generation to be even better at reducing food waste

Norway has a grocery store dedicated entirely to selling food nearing or past its best before dates!

Food Waste As A Global Issue – Mini Challenge

- Break into small groups, and each group pick a different country to research.
 - Working in your small group, create a poster which shows the types of initiatives that country is taking to reduce food waste.
 - Then, using your poster, present an initiative to the other groups on a food waste solution that Scotland could adopt.
- Tip: Choose an initiative you feel as a group, is interesting and different to the other countries.



Case Study – Colbeggie Fruit Farm

AP Barrie is a 4th generation family business, and will likely become a 5th generation family business in the future.

Colbeggie Farm grow **Strawberries**, **Raspberries** and **Blackberries** in Coupar Angus, Scotland. Their fruit supplies Tesco, Asda, Marks & Spencer, and also locally.



There are **two** main **food issues** that Colbeggie Farm are facing:

1. Lots of **food** from different aspects, small or imperfect berries being grown, and biomass from all the plants at the end of the season.
2. Lots of plastic being used within the growing (in polytunnels) and within the plastic trays (punnets) used for selling the product.

Colbeggie Farm can use plastic free recycled paper punnets, but these are far too **costly**.



Case Study – Colbeggie Fruit Farm

Challenge



As a class or in groups of 4 or 5, can you come up with a way of using the **biomass** from the **plants** to make a **suitable container** for storage and distribution of the soft fruit to retailers (Supermarkets).

You can present your ideas by creating a poster, a talk or a PowerPoint presentation.

Use the links provided below for some guidance:

- [Colbeggie Farm \(website\)](#)
- [What is biomass? \(website\)](#)
- [How does biomass energy work? \(1.30 min video\)](#)
- [Bioplastics \(website\)](#)



RawPac

RawPac is an established food packaging supplier who provide business' with sustainable packaging.

Below is a link to their website and videos on how their packaging is made and may provide some ideas for the challenge above.

[Why choose plant based packaging](#)



Case Study - Culbhuirg Farm

- Culbhuirg Farm is situated on a small island off of the west coast of Scotland which is the **Isle of Iona**.
- The island is only 1.5 miles wide and 3.5 miles long and a population of around 170 people.
- Culbhuirg Farm is Gaelic for “back of the fort” and is one of two farms on the whole island.



Photo Credit- Anna Preston

- The **overall aim** is to produce the best quality store lambs and calves that they can within the challenges of the location and climate.
- They have **330 breeding ewes and a herd of 26 breeding cows**. The breeding programme is designed to produce store lambs which are for meat. - All the store lambs are sold at around 4 months old through **Caledonian Marts** in Stirling.
- Culbhuirg Farm also manage the landscape sensitively through partnerships with **RSPB** and **National Trust For Scotland**.

Case Study - Culbhuirg Farm

Careers and Job Descriptions

- [Farm Manager \(Livestock\)](#)
- [Assistant Farm Manager](#)
- [Farm Secretary](#)
- [Animal Nutritionist](#)
- [Agricultural Scientist](#)
- [Ecologist](#)
- [Biochemist](#)
- [Technical Advisor](#)
- [More careers in agriculture](#)



Activity



Working in groups of 2-4 come up with **5 key skills** that you would need for a career in the **agricultural sector**. Use the links provided above to help you. Then as a group, **explain** the reasons behind **why** you chose those 5 key skills.

Individually write down **5 key skills** that **you** have. Finally compare your skills to the ones you came up with as a group. Are there any skills that you have in common with the agricultural sector?



Photo Credit- Anna Preston

Case Study - Culbhuirg Farm

The breeding programme on the farm not only produces store lambs that are sold **locally** in Scotland, but is also in the early years of work with **Iona Wool**. Iona Wool is an Iona Craft Shop initiative which aims to provide **sustained added value** to their wool-by-products which are **sheep fleeces**! Click the logo to find out more about Iona Wool.



Mini Challenge



Using the template provided design and create a sustainable product that can be made from sheep fleeces!

Extra: If you would like to share your design with the Iona Wool Team please use: **@ionawool**

#STEMchallenge

#zerowaste

#sustainability

#DYW

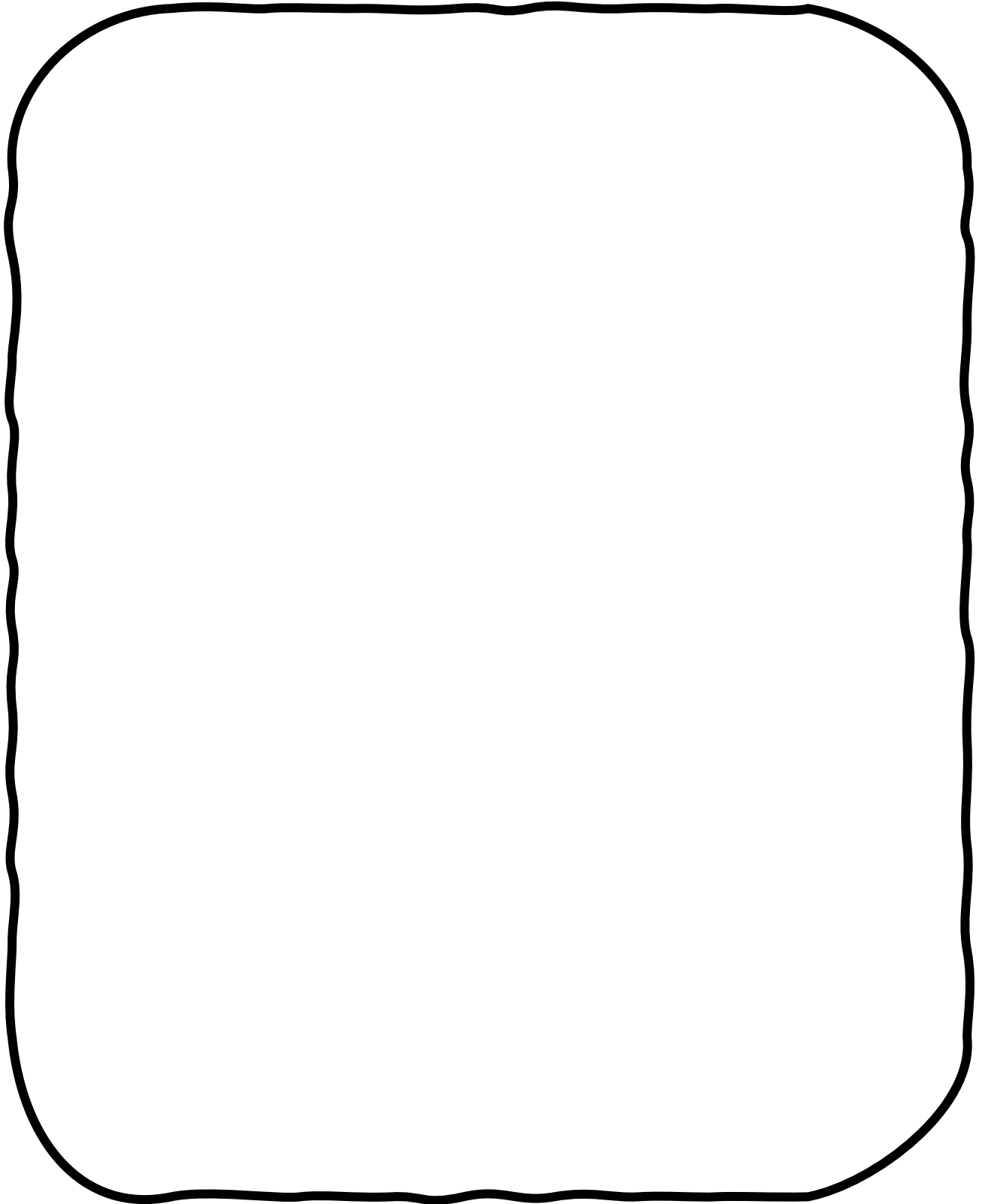
#toowoolforschool



Photo Credit- Anna Preston



Iona Wool Design Challenge



Case Study – Alcohol Brewing

From Field to Workshop

Draff is a business started by Aymeric Renoud who is a Dundee based designer and fabricator.



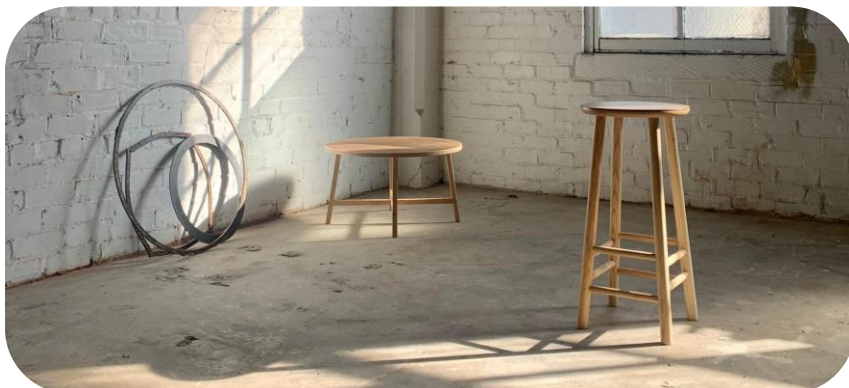
Aymeric has begun to explore the possibilities of reusing the wastage from alcohol production as a material, e.g. malt.

[What is malt? \(5 min\)](#)

From his workshop Aymeric creates bespoke pieces of furniture and is also involved with distillery and brewery collaborations.

The journey of Draff Material begins straight after the mashing or distilling process. The grain and botanicals are collected and dried out as quickly as possible. Heat and high pressure are then applied to the raw ingredients. The heating process also influences the colouring of the material.

[How beer is made and the science behind it \(6 mins\)](#)



Case Study – Alcohol Brewing

Career Descriptions in Brewing and Distilling

- [Brewer Worker](#)
- [Microbrewer](#)
- [Cellar Technician](#)
- [Bottler](#)
- [Horticulture Technician](#)
- [Warehouse Manager](#)
- [Technical Brewer](#)



Activity

Look at the career descriptions above and think of **3 key skills** each career would need. You can split into groups, pairs, as a class or individually to complete this task.



[Advice for a career in the brewing and distilling industry \(4 mins\)](#)

Draff is one fantastic example of reusing a by-product from distilling. Below is a short video on another way to sustainably produce alcohol and prevent waste.

[Sustainable beverage production \(3mins\)](#)



Future of Food Waste and the Industry

Food waste is a major issue that we are currently facing. You, your school and the Food and Drink Industry will need to all work together to reduce and prevent food waste!

There are so many amazing careers in the Food and Drink Industry which require a vast range of skills and attributes. Do not forget to have a look at what options there are out there, click the careers map below to take you there!



If you would like to learn more about Food Waste Prevention, Sustainability or Food and Drink Industry please follow us on social media!

@DYW_DA
@FoodInAbertay



@ZeroWasteScot
@FDFScotland

Further Study Opportunities

Abertay University

[Food Science, Nutrition and Wellbeing BSc \(Hons\)](#)

[Food and Consumer Science BSc \(Hons\)](#)

[Food, Nutrition and Health BSc \(Hons\)](#)

[Fitness, Nutrition and Health BSc \(Hons\)](#)

Glasgow Caledonian University

Food Bioscience BSc (Hons)

Queen Margaret University Edinburgh

Nutrition BSc (Hons)

Dundee and Angus College Courses

HNC Hospitality Operations

HNC Professional Cookery

Introduction to Hospitality Operations

Introduction to Professional Cookery

Modern Apprenticeship in Hospitality (Professional Cookery at SCQF Level 6)

Modern Apprenticeship in Hospitality (SVQ 2 Professional Cookery)

Modern Apprenticeship in Hospitality (SVQ in Food and Beverage Service at SCQF Level 5)

Modern Apprenticeship in Hospitality Supervision & Leadership at SCQF Level 7

Modern Apprenticeship in Professional Cookery (SVQ in Patisserie and Confectionery at SCQF Level 7)

NC Hospitality Operations

SQA Scottish Certificate for Personal Licence Holders

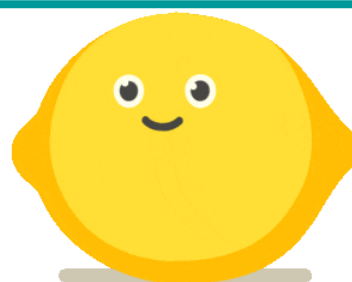
SVQ Level 2 Professional Cookery Fast Track

SVQ Level 2 Professional Cookery

SVQ Level 3 Professional Cookery (Patisserie and Confectionery)

SVQ Level 3 Professional Cookery

If you are thinking about a career in the Food & Drink Industry please look into some of the courses available. Some examples are detailed here on this page!



Food Waste and Sustainability Wordsearch

h i f b y c w d a t r f u l g e o p
a c o n s u m p t i o n e y j r d l
f u l i n x r e a m g u c j k v u p
s p k r e i c o n x h o y w n f t q
a c f i b g n a i r a t i x e l f e
i y u w k a t n c d i l o h u b x m
z c p f a r v w i l g q e s s f m o
y l n w a o b z a n t e s o t w a y
d i g p e u t n i s m q u l n i g e
e n i e s l o m a j t c z o a y r b
a g t y o s v x n e l e w c l d i k
q u r o a x z k g i l m i a p g c f
z t a e h t i o n p i e e q s a u n
b e s s r e s i l i t r e f o k l m
f i t x t n a o u r s e b h l d t k
d a j i r u w s e c g h m e w o u p
p r e s o u r c e s o x u y m t r e
q a k x j h s d i e u f l f o a e h

- consumption
- agriculture
- resources
- fertiliser
- plants

- fuel
- seasonality
- upcycling
- flexitarian
- waste