

Reformulation

A guide to reformulation
in the food and drink industry





Before we start...

- What is your favourite food, drink, or snack?
- How often do you eat it?
- What is it about the product that you enjoy?
- What impact do the nutrients have on your health... good and bad?

What is reformulation?

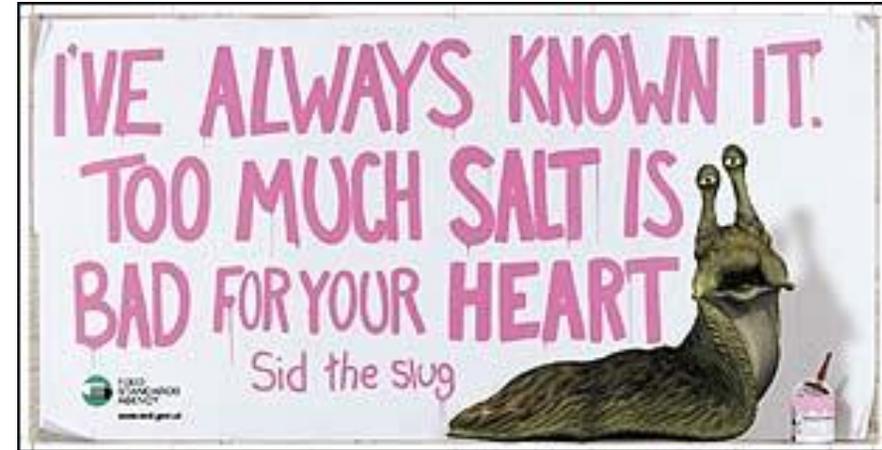
- Reformulation is the process of changing the recipe of a product
- Recipe changes can be needed for many reasons:
 - To cope with supply chain issues
 - To make foods healthier
 - To make foods safer
 - To make products more sustainable
 - To make products more affordable
- The Scottish Government is supporting manufacturers to make certain changes through reformulation:



What other changes could be made through reformulation?

Why might you reformulate a product?

- Brand responsibility to consumer health
- Consumer trends
 - “healthy snacking”
- Nationwide health campaigns
 - Action on Salt
 - Action on Sugar
- Government targets
 - Public Health England targets for calories, salt, and sugar
- Legislation
 - Promotion restrictions for foods High in Fat, Sugar, and Salt (HFSS)
 - Mandatory calorie labelling



Is Reformulation here to stay?

- The UK government has introduced a range of programmes to encourage reformulation.
- Restrictions on advertising and store promotions of products high in fat, sugar, and salt; and also calorie labelling in ‘out of home’ environments (ie. restaurants and cafes) will encourage even more reformulation.

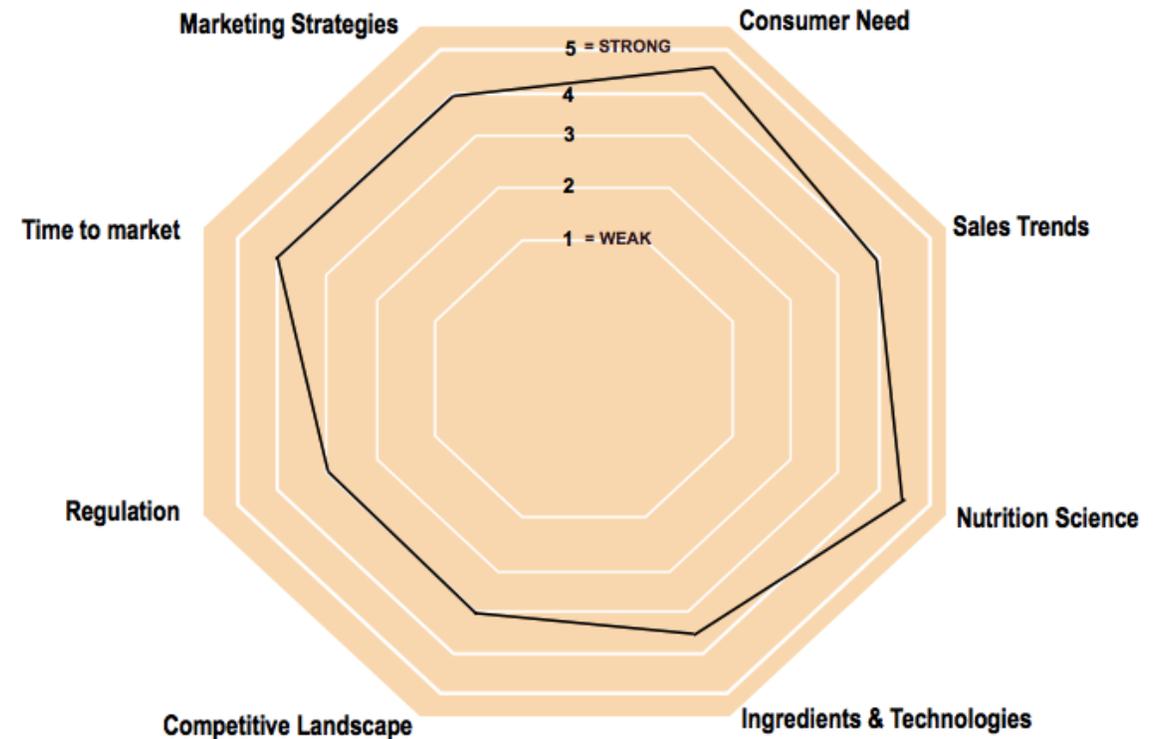
| Programme | Categories | Published date | Guidelines |
|---------------------------|---|----------------|--|
| Salt reduction | 84 | September 2020 | Salt targets for each category by 2024 |
| Soft Drinks Industry Levy | Sugars-sweetened beverages | March 2016 | Two levels: 5g and 8g sugars/100ml |
| Sugars reduction | 13 (food categories) | March 2017 | Based on sales-weighted average: 5% sugar reduction by year 1 20% sugar reduction by 2020 |
| Sugars reduction | 7 (juice and milk based drink categories) | May 2018 | <u>Milk based drinks</u> 10% sugars reduction by 2019 20% sugars reduction by 2021 <u>Juice based drinks</u> 5% sugars reduction by 2021 |
| Calorie reduction | 12 | September 2020 | 10% reduction, alongside a maximum guideline for single serve products, for most retailer and manufacturer branded products. |
| Baby food guidelines | TBC | 2022 | TBC but based on total sugars, free sugars and salt. |

There are many definitions of what a trend is...

New Nutrition Business' definition of a Key Trend is one that:

1. Will stick around
- and*
2. Will produce growth for products and brands that connect to it

We evaluate every emerging trend on every parameter



Health is a trend that is here to stay that drives reformulation

How do you research a food trend?

- The Internet is where people go first for their information.
- The huge diversity of information about health and nutrition on the internet helps drive diversity of consumer beliefs.

But to accurately research and identify trends.....

- **Keep track of industry influencers and publications**
- **Read up-to-date industry research and trends reports**
- **Make the most of digital tools and analytics to assess industry behaviour**
- **Listen to your customers**
- **Observe your competitors**

How would you reformulate a food product?

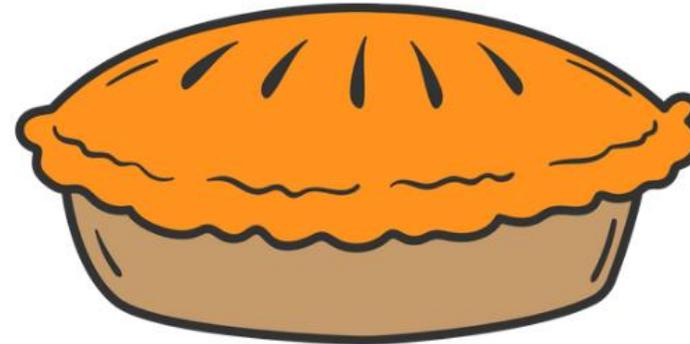
Finished product

- Health by stealth?
- Advertise changes?
- Print new labels
- Monitor sales

Calculate nutritional specification

| Nutrition Facts | |
|------------------------|---------------------|
| Serving Size 100 g | |
| Amount Per Serving | |
| | Calories from fat 0 |
| Calories 250 | |
| <hr/> | |
| Total Fat 4% | % Daily Value* |
| Saturated Fat 1.5% | 4% |
| Trans Fat | |
| Cholesterol 50mg | 20% |
| Sodium 150mg | 10% |
| Total Carbohydrate 10g | 3% |
| Dietary Fiber 5g | |
| Sugars 5g | |
| Protein 10% | |
| Vitamin A 1% | Vitamin C 3% |
| Calcium 2% | Iron 2% |

*Percent Daily Values are based on a diet of 2,000 calories per day. Your daily values may be higher or lower depending on your calorie needs.



Benchmark product against:

- Competitors
- Labelling claims
- Health targets
- Legislation thresholds

Product trials

- Does it work with existing manufacturing processes?
- Sensory analysis – consumer acceptability?
- Laboratory analysis – shelf life testing

Create action plan

- Sugar reduction?
- Portion size?
- Fibre enrichment?

Reduce or replace?

- Many ingredients need a replacement
- Healthier alternative

Identify widely used ingredients

- Butter used in shell and lid
- Filling used in multiple pies

Identify product components

- Pie shell
- Pie lid
- Pie filling

Skills pathway: what skills are used in reformulation?

Communication

IT Software

Market research

Marketing

Finished product

- Health by stealth?
- Advertise changes?
- Print new labels
- Monitor sales

Calculate nutritional specification

| Nutrition Facts | |
|------------------------|-----|
| Amount Per Serving | |
| Calories 200 | |
| % Daily Value* | |
| Total Fat 45g | 90% |
| Cholesterol 150mg | 30% |
| Total Carbohydrate 10g | 20% |
| Sodium 100mg | 20% |
| Total Protein 10g | 20% |

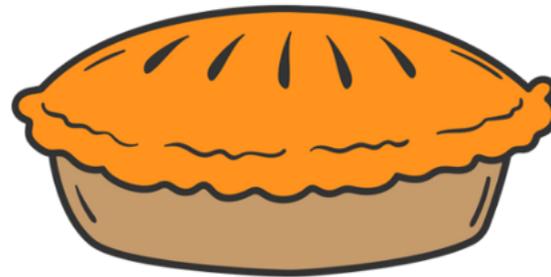
Benchmark product against:

- Competitors
- Labelling claims
- Health targets
- Legislation thresholds

Sensory science

Product trials

- Does it work with existing manufacturing processes?
- Sensory analysis – consumer acceptability?
- Laboratory analysis – shelf life testing



Create action plan

- Sugar reduction?
- Portion size?
- Fibre enrichment?

Science
Technology
Engineering
Maths

Team work

Reduce or replace?

- Many ingredients need a replacement
- Healthier alternative

Identify product components

- Pie shell
- Pie lid
- Pie filling

Problem solving

Researching solutions

Sustainability

Identify widely used ingredients

- Butter used in shell and lid
- Filling used in multiple pies

Data analysis

Nutrition

Food technology

Challenges of reformulation

- Every ingredient has functionality in the product
 - **Bulk**
 - **Flavour**
 - Sweetness, saltiness, flavour synergy, masking bitterness
 - **Food safety**
 - Sugar and salt can reduce available water, restricting growth of microorganisms
 - pH also limits microbial activity
 - **Appearance**
 - Colour or texture
 - **Chemical reactions**
 - [Maillard reaction](#) which provides browning and flavour
 - Gas production to help product 'rise'

Functionality needs to be maintained or replaced

- New formulation needs to be **cost-effective** for the manufacturer
- **Production processes** can be sensitive to change
 - Batch trials are needed to ensure the new formulation works in the factory environment
- Reformulated product needs to be **acceptable to consumer**



Healthy sustainable diets

- Many brands are focussing on reducing their **carbon footprint**, and looking for ways to be more sustainable
- A manufacturer could be importing ingredients that need to be transported across the globe. The **preparation, packaging, transport, and storage** of goods increases the footprint of the product, having a negative impact on the planet and contributing to global warming
- Reformulation can be carried out to reduce the carbon footprint of a product. By **swapping** high-footprint ingredients for **locally sourced**, or **more sustainable** ingredients, a product can be made more sustainable
- Many retailers and consumers actively want more sustainable, lower-carbon options
 - For example, many brands have removed Palm Oil from their products or switched to [sustainable palm oil](#).
 - Iceland no longer sells products containing palm oil.



What's the impact of reformulation?

These are examples of real product reformulations:

- **Breakfast:** A Scottish bakery reformulated a white roll, increasing the fibre content while keeping its light colour. The product now contains over double the fibre than the original recipe; an additional 1.2g in each roll. If a consumer swapped two morning rolls for these items, the extra fibre would account for over **20% of the average fibre deficit** and set them on their way to achieving the recommended intake of 30g fibre a day.
- **Lunch:** The biggest bakery brand in Scotland sells enough scotch pies each year to create a stack 51 times the height of Mount Everest. They **removed 15 tonnes of salt** from the pie cases they make and use... that's the same weight as 15 cars.
- **Snack:** A leading brand of Viennese Whirls has been reformulated to contain **30% less sugar** than the original. If you enjoyed 2 biscuits with a cup of tea, the original recipe would have contained half of your daily allowance of free sugars... the reformulated product contains around a third.
- **Dinner:** The biggest macaroni cheese brand in the UK made one small change to reduce the fat in an ingredient which is used in many of their recipes. This has **removed over 109 million calories** from the product range.

Just small changes to a range of products can have big impacts on dietary health.

Case study: Ice cream reformulation

- We worked with an Ice Cream manufacturer who makes 15 flavours of ice cream
- They wanted to change the **traffic light labelling** from **red to amber**, to make it more acceptable to customers.
- We decided to **reformulate the core recipe** which forms the base for most of their flavours.

- We calculated their nutritional specification using **computer software**, helping us to identify the **nutrients** and **ingredients** to address, and by **how much** they would need to be reduced to cross the labelling threshold:
 - Sucrose, dextrose, full fat milk, cream
- Sugar and fat are very functional ingredients in ice cream
 - **Sugar lowers the freezing point** of ice cream mixture. Without sugar, it would be hard like ice
 - **Fat is involved in forming bubbles** in ice cream, and gives a **creamy mouth feel**

- Simply reducing sugar and fat was not an option; **replacement ingredients** were needed to **mimic their functionality**.
- This was possible in a number of ways, so **two potential formulations** were made and **taste tested**.
 - Inulin (fibre) + rice starch
 - Tapioca starch
- **Sensory analysis** showed both formulations were similar to original product.
- **The final formulation was 30% lower in saturated fat, and 15% lower in sugar.**



Ice breaker exercise

- Think back to the product you identified at the beginning of the session.
- If you were to reformulate the product, what nutritional improvements would you aim for?
 - Calories
 - Saturated Fat
 - Fat
 - Sugar
 - Salt
- Do you know what ingredients go in to this product?
 - Which of these are heavy in the above nutrients?
 - How far have these travelled before going into the product?
- As well as removing nutrients, could you add fibre, fruit, or vegetables?
- Is the product affected by any government targets or legislation?
- How often do you consume this product? Would making it healthier have a large impact?

Resources

- [FDF Scotland Reformulation for Health webpage](#)
- [FDF Scotland reformulation guide](#)
- [Food Education Scotland](#)
- [Food a Fact of Life sensory analysis resources](#)
- [Institute of Grocery Distribution Reformulation topic page](#)
- [FDF High in Fat, Sugar, and Salt \(HFSS\) toolkit](#)
- [Summary sheets for 2024 salt and calorie targets](#)
- [FDF Scotland Youtube channel](#)
- [FDF Sustainable Palm Oil](#)
- [Public Health England reformulation programmes](#)
- [Quality Meat Scotland Butchery Careers resource](#)
- [Quality Meat Scotland Farming Footsteps education resources](#)