

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?

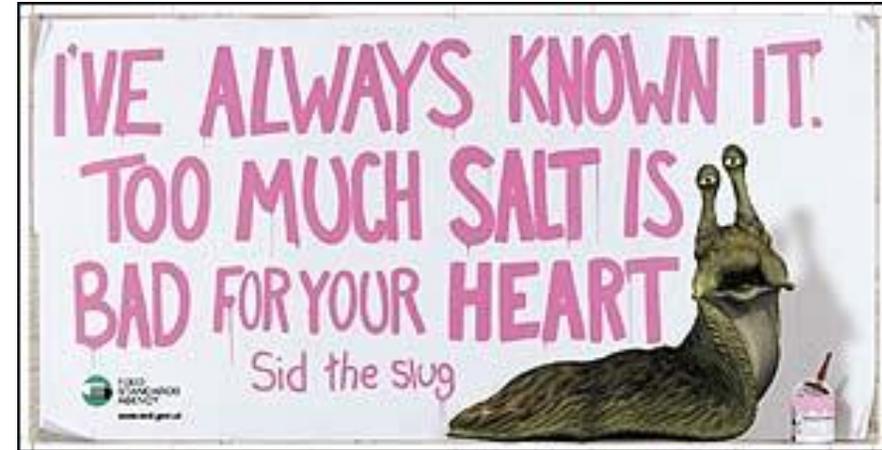
- Reformulation is the process of changing the recipe of a product
- Recipe changes can be needed for many reasons:
 - To cope with supply chain issues
 - To make foods healthier
 - To make foods safer
 - To make products more sustainable
 - To make products more affordable
- The Scottish Government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

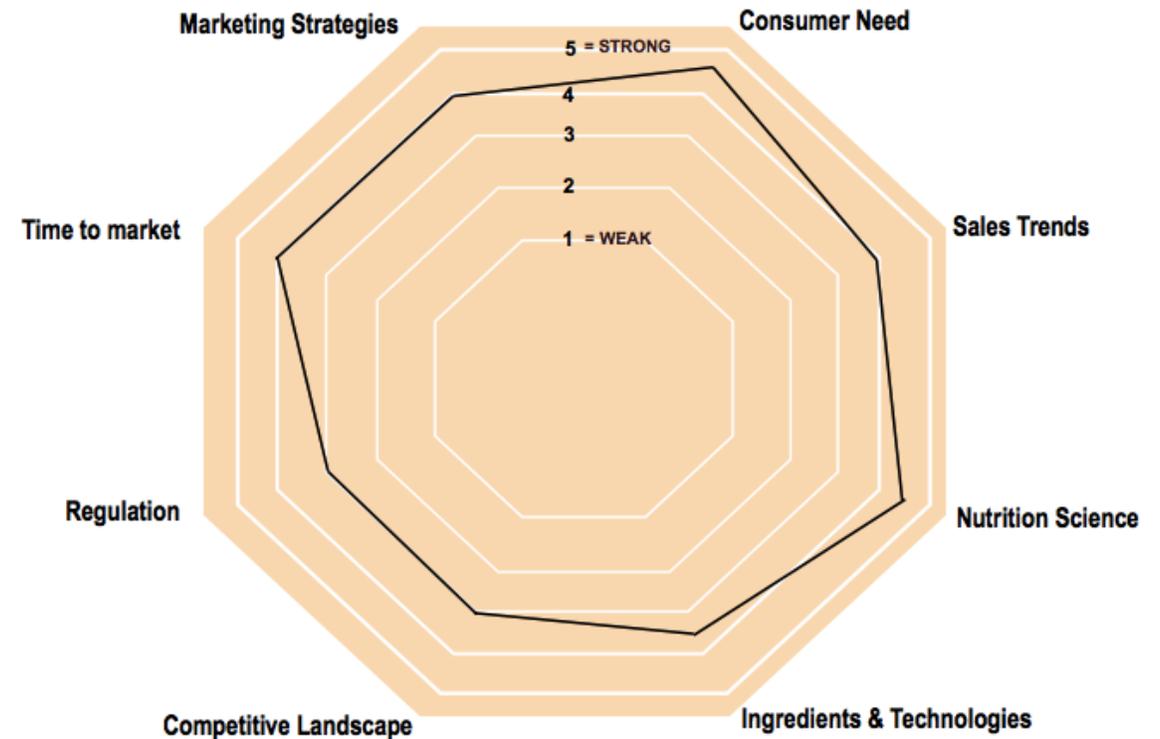
Programme	Categories	Published date	Guidelines
Salt reduction	84	September 2020	Salt targets for each category by 2024
Soft Drinks Industry Levy	Sugars-sweetened beverages	March 2016	Two levels: 5g and 8g sugars/100ml
Sugars reduction	13 (food categories)	March 2017	Based on sales-weighted average: 5% 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?

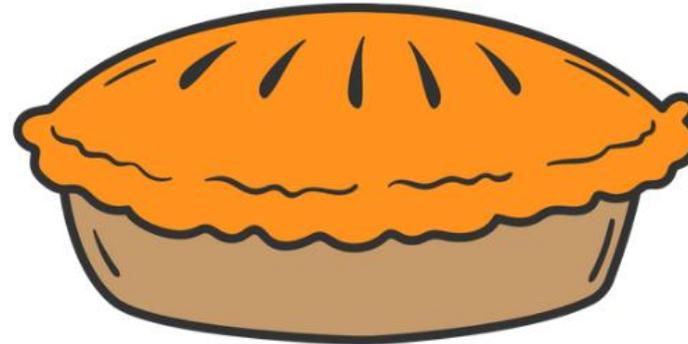
Finished product

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

Calculate nutritional specification

Nutrition Facts	
Serving Size 100 g	
Amount Per Serving	
Calories 250	Calories from fat 10
% Daily Value*	
Total Fat 4%	4%
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%
Fiber 5g	10%
Sugar 5g	10%
Protein 10g	20%

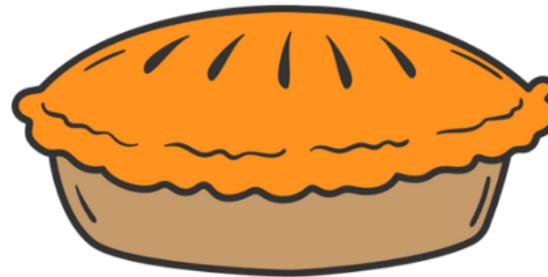
Benchmark product against:

- 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](#)