Reformulation for Health

Reformulation Support

A guide for Bakers

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Helping food businesses REFORMULATE for a healthier future

Contents

Introduction

The Reformulation for Health programme is funded by the Scottish Government to help Scottish SME manufacturers to make their produce healthier.

This is a direct action generated from the 'A Healthier Future' report published by the Scottish Government in 2018. The programme now provides free access to technical support, horizon scanning, networking, funding opportunities, and a whole Toolkit of free training and reference resources.

Engagement with the programme is free. Food and drink manufacturers based in Scotland can receive support by contacting reformulation@fdfscotland.org.uk. Supporting organisations, such as ingredient suppliers, retailers, and NGOs can also engage by joining the Reformul8 Partnership here. This is the network of organisations that can play an influencing or supporting role in reformulation, open nationwide.

The programme is supported by industry partners including Scotland Food & Drink, Interface, and Food Standards Scotland (FSS), who have facilitated multiple funding opportunities for Scottish SME manufacturers. The Healthier Bakery Fund launched in 2023 was funded by Food Standards Scotland, following the release of their report analysing the energy content of different types of sweet discretionary foods in Scotland. It was found that cold desserts surveyed contained an average of 709 calories, with the highest product containing 1,639 calories in one portion. The programme now provides further support to help the bakery sector interpret what reformulation techniques could benefit their brand, including the webinar Healthier Bakery – A Recipe for Reformulation Success and this guide.

Joanne Burns, Reformulation for Health Manager.

"The bakery sector has fantastic potential to reformulate commonly consumed products to improve the health of Scotland's products and people. Many of Scotland's favourite products are produced by our trusted bakery sector from butteries and empire biscuits to scotch pies and sausage rolls. These products are ripe for reformulation as they cover a wide range of potential projects from fat, sugar, salt and calorie reduction to fibre enrichment. Historically bakers have responded positively to industry trends and consumer requests, I am excited to see how the bakery sector reacts to current health drivers such as the Salt Reduction targets 2024, future HFSS legislation and mandatory calorie labelling.

Reformulation doesn't need to be a challenge. The Reformulation for Health team is on hand to help, and we look forward to assisting you on your reformulation journey."

The process of reformulation

Each reformulation project will be unique to the product and brand, and the reason for reformulating. There are, however, universal stages that can be followed to ensure the impact and integrity of the project:

START - Select a product, range, or ingredient to reformulate. Use the horizon scanning section of this guide to identify products that could be subject to nutritional targets or legislative restrictions. Look for opportunities to maximise the impact of your work by identifying any base recipes that are used in multiple products, such as pastry or icing.

REVIEW - Nobody knows your product better than you. What components are rich in nutrients such as fat, salt, or sugar? Are there components of the product that are particularly unique to your brand? Do you have any customer feedback on your products that could support your reformulation project?

If you do not know the nutritional content of your product, we can calculate this for you. The software used for this can also highlight key ingredients that are contributing the most to certain nutrients, and direct us to the most impactful recipe adjustments.

BENCHMARK - Mapping the nutritional specification of your product against competitor products and legislative standards can help provide direction for reformulation. If you are reformulating to meet requirements set by a new supplier, don't forget to check if the same reformulation project could also unlock a labelling claim, or help the product move from red to amber traffic light labelling. Give the reformulation longevity by checking that you are prepared for future standards as well as the current drivers.

ACTION PLAN - The gathered information can now be used to schedule time and resources. Organisations with in-house technical staff may have the capacity to develop and trial new formulations. Regardless of size, external support can be utilised; from ingredients suppliers who can provide free product development support, to consultants, to hosting a university food science student placement. Sign up to the Reformulation for Health newsletter to be notified of funding opportunities, and contact the team to be introduced to our Reformul8 Partners who can help with any of the above.

DEVELOPMENT - A variety of recipe adjustments can be trialled, using different ingredients or nutrient adjustments. Successful recipes can be taken to factory trials to ensure the process is scalable. This process can involve many disciplines from the organisation; NPD, operations, engineers, suppliers, and marketing. This can be utilised as an upskilling opportunity for staff members who have not worked on an existing product development project before. Use our Toolkit page to access free resources to support your team.

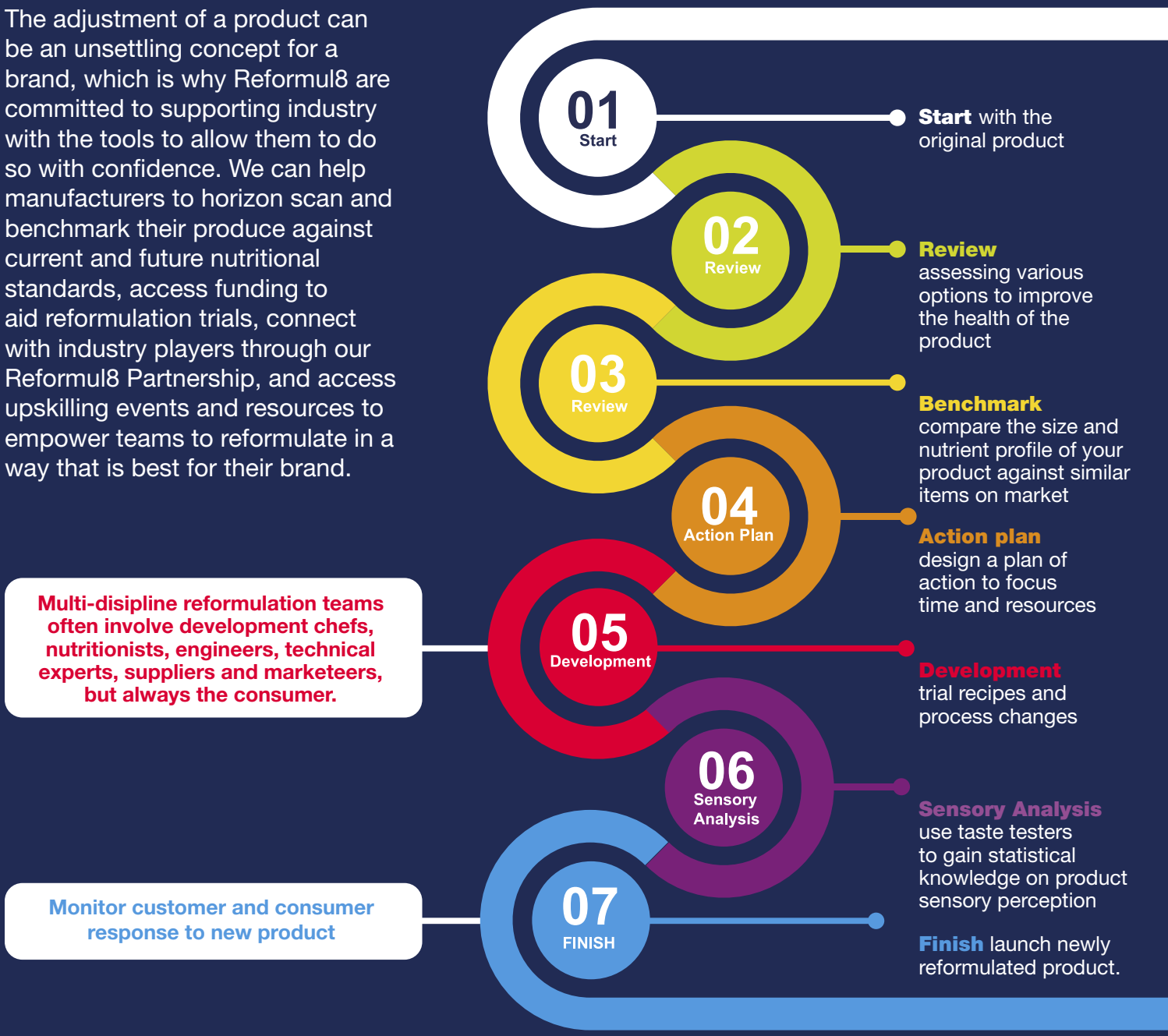
SENSORY ANALYSIS - The most important factor in reformulation is customer experience. Carrying out sensory analysis of a product prior to market can generate valuable feedback and give you confidence in the reformulated product. Read our Sensory analysis for SMEs guide here.

FINISH - It's now time to launch your reformulated product! Monitor sales and customer feedback on the new product. Review the process to identify key learning points from the process that could be used in the future.

View our guide to the reformulation process here.

The process of reformulation

The adjustment of a product can be an unsettling concept for a brand, which is why Reformul8 are committed to supporting industry with the tools to allow them to do so with confidence. We can help manufacturers to horizon scan and benchmark their produce against current and future nutritional standards, access funding to aid reformulation trials, connect with industry players through our Reformul8 Partnership, and access upskilling events and resources to empower teams to reformulate in a way that is best for their brand.



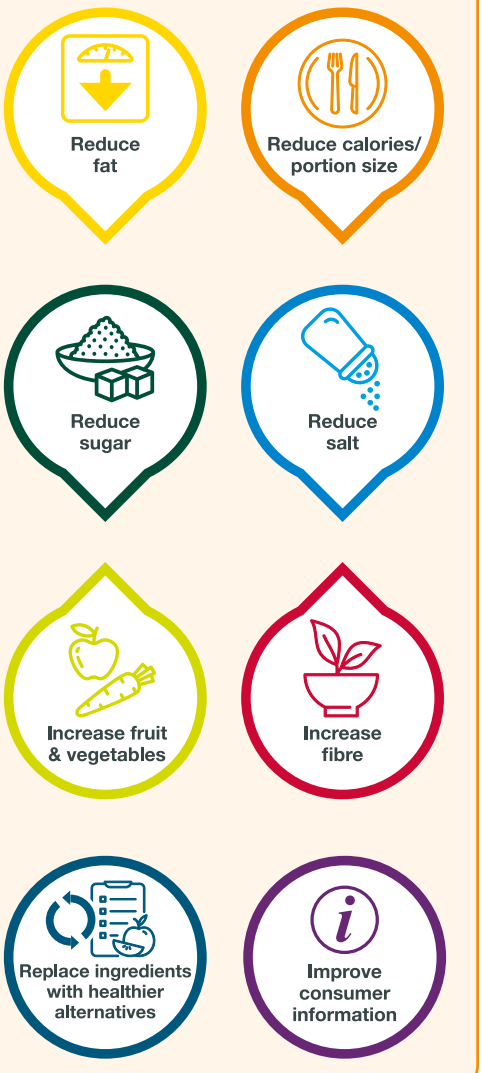
The principles of reformulation

Some of these principles focus on specific nutrients that are key in improving public dietary health in Scotland. A principle that can be applied to any product is to review the size of the total portion, or components of a product. This could involve making slightly smaller portions (which could be served with an item of garnish if it is a noticeable change) which will yield a reduction in all nutrients and calories. Individual components can also be reviewed, and making reductions to a filling or topping can yield the same benefits. Again, consider which changes will be most nutritionally beneficial based on the ingredients in each.

Providing information that can help consumers prepare or consume your product in a healthy way can also help forge a relationship with your customer base, as well as supporting their dietary health. This could include providing portion guidance on large items (eg. This steak pie contains X number of portions) or serving suggestions to help customers incorporate more vegetables with your product. This could be done using recipe cards in the shop, or through social media to raise the profile of your brand in the local community.

Learn more about the principles of reformulation in our comprehensive guide.

The Reformulation for Health project works to support the 8 principles of reformulation developed around the Scottish dietary goals:



Legislation, trends, horizon scanning

The joy of Scottish bakeries is in the wide choice of products, each unique to that business and often developed by a founding family member. As businesses have passed from generation to generation, the consumer profile however has changed. Purchasing and consumption patterns have altered drastically in the past few decades, and the health of the population with it.

In 2023 there are legislative and voluntary standards covering sweet and savoury bakery products. It is important to note that the voluntary standards are UK wide, while some legislations affect products sold in England or Scotland as indicated.

Voluntary targets

UK wide salt targets 2024

Targets per 100g of product are set out below, for both sodium and salt (Sodium x 2.5 = Salt).

Type	Description	Target Salt (g)	Target Sodium (mg)	Maximum Salt (g)	Maximum Sodium (mg)
Meat pies	Delicatessen, pork pies, sausage rolls	0.93	370	1.08	430
	Cornish & meat based pasties	0.8	320	0.9	360
	Other meat based pastry products	0.6	240	0.71	285
Bread & Rolls		0.85	340	1.01	405
Bread & Rolls with additions		0.9	360	1.08	430
Morning goods	Yeast raised	0.65	260	0.83	330
Morning goods	Powder raised	1.01	405	1.19	475
Cakes		0.4	160	0.66	265
Pastries		0.33	160	0.66	265
Sweet pastries & other shortcrust/ choux pastry based desserts		0.23	90	0.3	120
Sweet biscuits		0.55	220	0.85	340
Savoury biscuits		1.3	520	1.75	700

Click here for full information.

UK wide calorie targets 2024

A target of 20% calorie reduction has been set for pastry products, including pies, pasties, sausage rolls, tarts, and lattices.

Category	Type	Target kcal per portion	Maximum kcal per portion
Pastry products	Pies, pastries, sausage rolls, tarts, lattices	430	670

Click here for full information.

Target: 430kcal/ portion

Maximum: 670kcal/portion

Current legislative standards

Mandatory calorie limits

It is now a legal requirement for businesses in England with more than 250 employees, including cafes, restaurants and takeaways, to display calorie information of non-prepacked food and soft drinks (click here for more information). This is relevant to manufacturers in Scotland that supply to the specified businesses in England.

Advertising and promotion regulations for products high in fat, sugar, or salt (HFSS)

The UK government has introduced legislation surrounding the advertising and promotion of many products in retail and the out-of-home environment. This restricts where products considered to be HFSS can be placed in a store, and featured on online platforms, to limit the promotion of such items. More information can be found on the FDF Toolkit page.

Nutrient profile model (NPM)

The nutrient profile model is a numerical scoring system used to differentiate foods based on their nutritional composition. It balances the nutritional contribution of ingredients particularly important in the diet (fruit, veg, nuts, fibre, and protein) with those that should be restricted in the diet (energy, saturated fat, sugars, and sodium). A food item generating a score of 4 or more, or a drink generating a score of one or more, is deemed to be HFSS. The NPM system being used in this legislation is the 2004 to 2005 Nutrient Profiling Model. Read more about the NPM here and contact us for support calculating the NPM score for your products.

What items are included?

A total of 22 categories are covered by this legislation. The full list can be found here. Any item within these categories found to have a Nutrient Profile Model score of 4 or more is considered HFSS and in scope of these restrictions.

Those categories most relevant to the bakery industry are:

- **Chocolate confectionary**
- **Sugar confectionary**
- **Cakes**
- **Sweet biscuits**
- **Morning goods**
- **Pudding and dairy desserts**
- **Family meal centres**
- **Main meals (out-of-home)**
- **Starters, sides, and small plates (out-of-home)**

Future legislation

The situation in 2023

Advertising and promotion regulations for products high in fat, sugar, or salt (HFSS) in England

Further aspects of the advertising and promotion regulations for HFSS products are still to be introduced in England. This includes a ban on multibuy promotions of HFSS products, including 2 for 1 and Buy one get one free offers. The introduction of these has been delayed until 2025.

Mandatory calorie labelling in Scotland

The Scottish Government has consulted on the introduction of mandatory calorie labelling in the out of home sector, similar to the standards in place in England. There is currently no implementation date, but this is expected to be introduced in the coming years.

Restricting promotions of food and drink high in fat, salt and sugar (HFSS)

In 2022, the Scottish Government and Welsh Government held separate consultations on legislation to restrict promotions of food and drink considered to be HFSS. The Northern Ireland Government has also stated its intention to limit promotions of HFSS products.

Details of these policies are still to be confirmed, but it is likely that the scope of product categories and promotional mechanisms included will vary from the framework already in place in England.

For further information on HFSS policies as they evolve, see the FDF HFSS toolkit.

Fat reduction

At 9kcal per gram, fat is the most calorific nutrient found in bakery goods. A manufacturer mindful of calorie content, or reviewing their specifications in response to mandatory calorie labelling, can make swift wins through fat reduction.

Fats can be classified by their structure; unsaturated fats tend to be liquid at room temperature, while saturated fats tend to be solid at room temperature. The fatty chains that make up each type of fat interact differently within the body, and saturated fats can contribute to heart disease, stroke, and high cholesterol. Consumption of fats should be less than 35% of total daily kilocalorie (kcal) intake (that's 78g total fat in a 2000kcal diet). Of this, saturated fat intake should be less than 11% (equating to less than 20g in a 2000kcal diet). Average consumption in the UK exceeds all the recommended limits, but slight recipe changes across the food and drink industry could help consumers stick to safe limits without removing items from their diet completely.

Considering that a typical croissant or sausage roll around 6g saturated fat each, what is the best way to reduce fat?

Consider the components of your product that include fat. A baked product that consists of pastry or batter, and an inclusion (sweet or savoury) has two immediate opportunities for fat reduction. By completing a nutritional analysis of the product, or perhaps from your own experience, you can identify the biggest contributor of each nutrient. If the component is sourced from a third party, contact the supplier and request a healthier option (this is the easiest way!). If the component is made inhouse then ingredient alternatives can be used to substitute some, or all, of an ingredient.

Fat Reduction

Batter and pastry

Reduced fat butter alternatives

Butter contains approximately

80% fat

and around

50% saturated fat.

It is a 'water in fat emulsion' meaning it is mostly fat, appears solid, but holds some water within. Butter alternatives such as margarines that replace an amount of saturated butter fat with unsaturated oil, can provide a healthier option. There are also products available which incorporate more water to reduce the fat content, but are too low in fat to legally be called a margarine. Historically, many margarines were found to be high in trans fats which can raise 'bad' cholesterol and lower 'good' cholesterol. This has now been addressed by many manufacturers, so remember to request that your margarine (or low fat margarine alternative) is low or free from trans fats.

A straight swap like this is a versatile option that can be easily incorporated into an existing SOP.

TOP TIPS

Contact your ingredient suppliers to see if they have an 'off the shelf' alternative which is lower in fat, sugar, or sodium, or higher in fibre.

TOP TIPS

Is there a core recipe you could improve that would impact several products, such as a pie casing or batter?

Clean label fat mimicker

Food technologists have found great functionality in isolated starches, fibres, and flours. It is now the case that the functionality of fats, including mouthfeel, structure, binding, and water migration can be replicated with such ingredients. Fibre is very low in calories (soluble fibres can be metabolised by our gut bacteria which then produce healthy compounds which our bodies can use) up to 2kcal per gram. Substituting calorie rich fat with fibre will efficiently reduce the overall calorie content. It also brings the added bonus of fibre enrichment, adding another health benefit to the product.

Many of these products are purchased as powders which are rehydrated using water (or milk depending on application) prior to use. The label declaration follows the ingredient origin, such as 'tapioca starch' or 'wheat flour' or 'chicory root extract'. Suppliers of these ingredient types often offer a free product development service to ensure an optimal application of their ingredient in your product.

If your product is packaged for retail, check if incorporating a fibre ingredient could qualify your product for a labelling claim. A 'Source of fibre' claim can be made if a product contains at least 3g of fibre per 100g, or 1.5g of fibre per 100kcal. A 'high fibre' claim can be made on products containing at least 6g of fibre per 100g, or 3g of fibre per 100kcal.

Egg alternatives

Eggs provide a range of functionality in baking, including binding, aeration and structure, and leavening. A medium hen's egg contains around 130 kcal and 9g fat (as a truly natural product, eggs vary in volume even within size categories). The price of eggs has shown volatility in recent years, increasing in price steadily since 2019 and sharply since 2022 (reference), which has led to some manufacturers considering alternatives.

Replacing a portion of egg content in bakery can provide a solution for calorie and fat reduction, and also supply chain management. Some products may also provide cost stability (dependant on egg market activity) and can be used in core batter recipes for multiple products.

TOP TIPS

Items don't need to be changed unrecognisably. The benefits of small tweaks add up.

TOP TIPS

Do your customers want to know? You don't need to advertise any changes, but consider if labelling could benefit any products such as items specifically popular with children.

The performance of egg can be replaced by a number of ingredients including aquafaba (chick pea water), tapioca starch, pea protein, and others. Between 20 and 100% egg can be substituted, depending on the ingredient and application, often with a very short development process.

Do you use chickpeas in any recipes? Consider additional cost saving by making aquafaba in house from chickpea water. This could also reduce food waste.

Fillings and inclusions

The benefit of multi component products is the opportunity to make small adjustment to multiple parts of the product, or identify one high impact component to adjust. Both sweet and savoury baked goods with fillings provide this opportunity, from a fruit tart to meat pie.

TOP TIPS

It's good to talk…. ask your customers if there are any products they would buy more of if they were healthier.

Sweet fillings can utilise the above fat reduction ingredients for fillings and inclusions made inhouse. A reduction in fat can also be achieved by the addition of a new low or no-fat ingredient. Incorporating fruit, for example, can reduce the overall fat content per portion while also boosting the product with fibre and vitamins. Certain products also benefit from the colour and appearance of fruit.

If using ready to use inclusion products, enquire if your supplier has a lower fat or reformulated product. Read our case study about how R&W Scott developed a HFSS compliant caramel sauce by reducing the fat content.

Savoury bakery fillings containing meat can reduce the fat, saturated fat, and calorie content by reviewing the meat content; opting for leaner cuts (or a combination of original and leaner cuts), or reducing the volume of red meat per batch. If doing so, consider the texture and mouthfeel of the other ingredients, to maintain the heartiness of the product.

Pulses such as lentils, split peas, and beans, or grains such as barley, can add texture and mouthfeel if reducing such ingredients. Get some inspiration from our Butchery podcast featuring Gordon King (Scottish Craft Butchers) Tom Courts (Tom Courts Burntisland Butchers), and Andy Benn (Food Makers).

TOP TIPS

Find hidden sources of sodium by using the search function in a word document. This could highlight processing aids in ingredient specifications that contribute to the total sodium content.

Cooking

Fat can also enter a product during cooking, especially if the item is fried. Reviewing this process and opting for a healthier oil, or utilising air frying or baking in place of deep frying, can reduce the fat or saturated fat content of all products without recipe change.

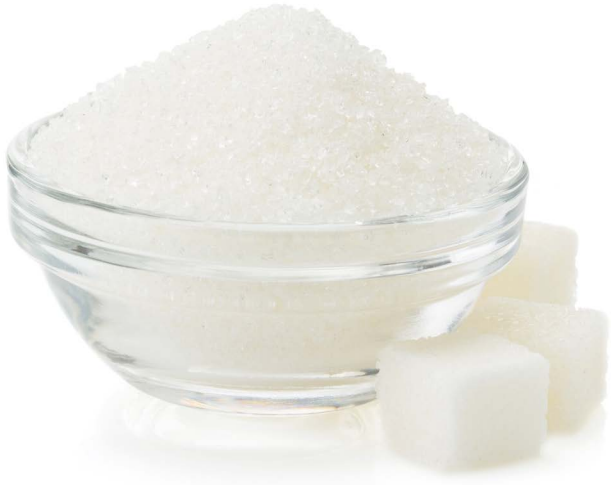
Useful links:

- SACN Report on Saturated Fats and Health 2019
- British Nutrition Foundation – Fat
- FoP Guidance Document

Sugar Reduction

Sugar is a staple ingredient in sweet baked goods, providing bulk, viscosity, preservation, colour, and of course sweetness. It is a short-chain carbohydrate produced by plants for quick, short term energy. In plants, the short chains can be joined together to form starch, an energy storage component, or fibre which is used for structure. When consumed, sugar provides 4kcal per gram and is readily broken down in the body. This causes spikes of blood glucose levels, activating the body's process of responding with insulin. The shorter the carbohydrate-chain, the greater the sugar spike on consumption (known as Glycaemic Index). Excess consumption of sugar puts strain on this process and can lead to health conditions such as type 2 diabetes and cardiovascular disease.

The Scientific Advisory Committee on Nutrition (SACN) recommends management of dietary sugar in two forms; free sugars which are those isolated from the source (ie. Caster sugar) and sugars contained within the cellular structure of food which would encompass the sugar content of a fruit or vegetable. This helps individuals to balance the consumption of foods containing isolated sugar added for sweetness and technical reasons, with the other health benefits of foods naturally containing sugars (including fibre, vitamins, and long-chain carbohydrates). SACN advises restricting consumption of free sugars to 30g for adults, 24g for children aged 7 to 10, and 19 for children aged 4 to 6. Average consumption of free sugars is over twice the RDA in adults. More information on recommended sugar consumption can be found here.



With some cupcakes containing up to 41g sugar each, consumers can easily reach these limits within a typical diet. So how can bakers adjust sugar content to make sure their products' longevity?

TOP TIPS

Many health improvements can be made by simply contacting your suppliers and requesting healthier versions of your ingredient or premix.

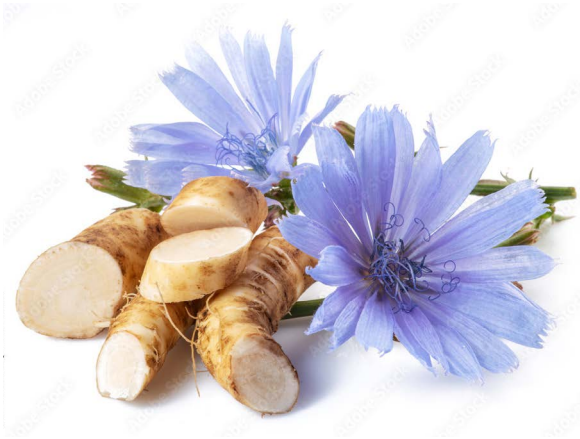
Sweet baked goods

Clean label sugar alternatives

Altering the main pastry or batter mix used across multiple sweet products can produce nutritional benefit to multiple products with just one main recipe adjustment. This can be used for sugar reduction by incorporating an ingredient that can replicate the functionality of sugar. Isolated starches and fibres can be used as a straight swap for a portion of sugar in many recipes.

Starches can be isolated from crops such as tapioca and rice. Applications include cakes, flapjacks, snack bars, and biscuits. Up to 25% of sugar can be replaced with an isolated starch product, which have the same storage requirements as caster sugar. Starch has the same calorie content per gram as sugar, so use as a swap out does not provide calorie reduction benefits.

Fibres can be isolated from crops such as chicory root. The use of fibre is multifaceted, enabling both sugar reduction and enrichment of a nutrient which the UK population is widely deficient in. It is also less calorific than sugar, containing 1 – 2kcal per gram (product dependant).



Fibre ingredients are often marketed by a compound name, or using technical terminology expressive of their formation. This can include 'Inulin' (which has received much press as a health promoting ingredient) or technically as 'Fructooligosaccharide' (abbreviated to FOS).

Sweeteners

There are two categories of sweetener; Intense, and Bulk. Intense sweeteners are hundreds of times sweeter than sucrose, and therefore are used in very small amounts in food and drink. Bulk sweeteners include polyols, also known as sugar alcohols. These compounds are found naturally in many foods, and can be produced industrially by fermenting sugars or sugar syrups.

The use of sweeteners is restricted within the bakery category. The use of some sweeteners is permitted in certain products developed for special diets, and must be labelled as such. Refer to the guidance here with updates made in 2002 here.

Fruit pastes and syrups

Tapping into consumer interest in 'healthy' and 'natural' ingredients, are several syrups, pastes, and powders available for sweetness and bulk. This includes:

Agave syrup is 1.3x sweeter than sugar, allowing for a lesser amount to be used to reach an equivalent sweetness. It is considered 'low GI' causing low blood sugar spikes after consumption, and contains a combination of fructose and glucose. Also available as a powder.

Date paste brings a sweet toffee flavour, less sweet than sugar containing glucose and fructose. It is low GI and also contains fibre, and can help bind products such as flapjack and cereal bars. Also available as syrup.

Toppings and inclusions

Adjustments in toppings and inclusions of a sweet product can help reduce the overall sugar content. This could include a slight size reduction of individual components (ie. The topping of an éclair).

Consider the sweetness of the total product and each component. It could be that an intensely sweet topping could be adjusted to contain slightly less sugar (by incorporating an ingredient such as cornflour for bulk) without making a noticeable impact. Many products already contain flavourings such as vanilla, which can help balance a drop in sweetness. The use of such ingredients can be adjusted in line with sugar adjustment to obtain an optimal consumer experience. Starches, fibres, and flours can also be used for substituting a portion of sugar in many toppings and inclusions.

Salt Reduction

Sodium Reduction

Salts come in many shapes and forms, but the one most used in the food industry is a compound of Sodium and Chloride. Used widely as a seasoning, it enhances favourable tastes by masking bitterness (try it for yourself – adding salt to tonic water hides the bitter taste of quinine). It is also integral to a number of food technology processes, including fermentation and colouring, and plays a vital role in food safety as it can restrict the growth of microorganisms. Sodium naturally present in foods contributes around 21% of a typical salt intake. Approximately 18% is added by consumers during cooking or as a final garnish, and 61% of salt intake is from pre-prepared foods (source).

TOP TIPS

Always consider the role of each ingredient and if it really is required in that volume

Sodium makes up 40% of sodium chloride, which is a naturally occurring mineral. Both sodium and sodium chloride can contribute to hypertension, so reducing the level of total salt or sodium within a salt blend will yield health benefits. The salt content of food is commonly reported as a 2.5 multiplication of sodium, which allows the use of lower sodium blends to be illustrated in a way that is easy for consumers to process and utilise for making dietary decisions.

To protect cardiovascular health, it is recommended that adults maintain a daily consumption of no more than 6g salt (2.4g sodium). It is estimated that 17,000 lives could be saved in the UK by reducing average salt intake to this level, from the current average 8.1g (source).

Pastries

While salt is a necessary requirement of many bakery components, it is sometimes used in quantities above what is technically required. Pastries made in house can be trialled with lower quantities of salt, to identify an optimal level for your brand's performance and taste. Bells Food Group recently used funding from the Reformul8 Challenge Fund to reduce the salt in their pie shells by 50%; one change that has benefited every short crust pie product in their range.

Reduced sodium salts can also be utilised for a swift sodium reduction. There are many reduced sodium blends, or naturally low sodium salt products available for use in bakery products. Blends may include magnesium, calcium, or potassium in substitution of a portion of sodium. Each bring their own flavour profile and technical characteristics, and a supplier can often help you select the best blend and concentration for your product.

Fillings

Product fillings made in house can benefit from the same principles as pastries, with a simple reduction of added salt, or use of a lower sodium blend.

Fillings that consist completely of, or contain, pre prepared components can also be considered for sodium reduction. Many suppliers have already developed reduced sodium components, which may be available on request. Read how Scobies Direct developed a higher fibre lower sodium sausage rusk here. Contact your existing supplier, or contact us for help sourcing such alternatives.

Processing aids

While sodium makes up 40% of salt, it is also present in many other food ingredients. Many additives including raising agents, emulsifiers, flavour enhancers, and, sequestrants, contain sodium:

Sodium Bicarbonate
Sodium Carrageenan
Monosodium Glutamate
Disodium Phosphate

If you carry out a document search for the word 'sodium' in any product or ingredients specification resources, does this highlight any sources of sodium you were previously unaware of? Contacting your existing supplier and requesting a non-sodium based alternative is a quick and easy way of reducing the total sodium content of your produce.

TOP TIPS

Many ingredients can be reduced by using a clean label alternative such as inulin, tapioca starch, or cornflower. The Reformulation for Health team can help you find suppliers and technical information if these are new to you.

Calorie Reduction

The term calorie is commonly used to describe the units of energy accessed by the body when we consume food. You may notice the term Kilocalorie (kcal) and Kilojoule(kj) within labelling and literature, but these terms all express the same concept. Our body's requirement for energy is dictated by our stage of life, gender, and level of activity, but the recommended intakes are 2000kcal for an adult female, and 2500kcal for an adult male per day. If we consume more energy than we burn through activity the excess energy will be stored as fat and result in weight gain. Obesity has a profound impact on public health, with **research** indicating that more than 1 in 20 cancer cases in the UK are linked to excess weight. The **2016 Scottish Dietary Goals** suggests an average reduction in calorie intake of 120kcal per day, to set the public health on a healthier trajectory.

Not all nutrients are equal when it comes to calorie content, as shown below:

Nutrient	kcal per gram
Fat	9
Carbohydrates	4
Protein	4
Fibre	0-2

Change on your terms; try reformulating just one component of the product, such as the pie pastry, filling, or topping.

Calorie reduction can be supported by addressing the ingredients containing the most calorific nutrient; fat. By substituting a portion of fat with any lower calorie ingredient, the calorie content of the product will immediately fall. Please review the **fat reduction** section for more techniques.

The use of fibre, as discussed throughout this guide, can also aid in calorie reduction. When used as an alternative for fat, carbohydrate, or protein, a calorie reduction is instantly achieved with the added benefit of increasing the fibre content. Please consult the **Enrichment** section to learn more about the importance of fibre in the diet.

Portion control is a simple way of reducing the total fat content, without making recipe changes. With the potential introduction of mandatory calorie labelling in Scotland, customers will be more aware of the calorific impact of items when purchasing and may be seeking portions and calorie counts to fit with their lifestyle choices. Many manufacturers are advertising 'less than 100kcal' portions of products in some ranges, to enable health-conscious consumers to say 'yes' to their product, confident that they are in control of their energy intake.

Always look for opportunities to enrich your product (eg. Inulin is a health promoting fibre, so using this to reduce saturated fat content can provide multiple health benefits).

Enrichment

The sometimes-forgotten principle of reformulation is the question of what can be added to a product. Health-conscious consumers are becoming ever more aware of key components that benefit their health, including wholegrains, fruit, vegetables, and fibre.

Fibre is an essential part of our diet, with preventative health benefits against heart disease, type 2 diabetes, and bowel cancer. Fibres can also support the gut microbiome which is of growing interest to consumers. Fibres vary in structure and composition, providing differing characteristics and benefits both as an ingredient and as a nutrient. The use of functional fibres has been discussed as a method of fat and sugar reduction in bakery products. Their use not only helps achieve the primary objective, but also brings the added bonus of fibre enrichment.

There are many types of fibre that have fewer interactions within a product and can be added purely to help boost the fibre content. Bespoke to the requirements of your product, they can be added in varying components of food products. Many ingredient suppliers and technical consultants can help in choosing the best ingredient for your requirement. We understand that the drivers for reformulation are broad, from the requirement to meet a certain nutritional specification to access a new supplier contract, or to adjust the NPM score of a product to avoid HFSS restrictions. Funding from the Reformul8 Challenge Fund helped Tower Bakery to develop a higher fibre white morning roll, to secure a tender to supply their local authority following the new Nutritional Requirements for Food and Drink in Schools. Read their case study here. Why not consider replacing a portion of white flour with brown, wholemeal flour? Even a 10% replacement would benefit your customers' health without drastically altering the appearance of the product.

In the UK SACN recommends that adults should eat 30g of fibre per day. Only 9% of adults reach the daily target.

As well as fibre, fruits and vegetables bring vitamins, flavour, and colour to a product. Incorporating more fruit and veg into your products can help your customers reach their '5 a day', which is currently achieved by only 22% of adults in Scotland. By the simple law of ratios, adding an extra ingredient to a product will reduce the proportions of other ingredients and nutrients per 100g. Incorporating mixed beans, onions, lentils, which are low in fat and high in fibre, can help to reduce the calories, fat, sugar, and salt of many savoury products instantaneously, while also adding the associated health benefits of vegetables and pulses. Sweet bakery can also incorporate vegetables such as squash, sweet potato, and beetroot, which also add vibrant colour to the product. If you're not sure how your customers will receive such products why not run a trial, targeting the products at a chosen demographic such as children? The experience from developing the products and considering customer feedback can help in other areas of product development, keeping your brand one step ahead of the competition.

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