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## **Developing food and drink for a nutrition, health and wellbeing market**

Campden BRI's recent survey to identify innovation needs of the food and drink industry highlights the key areas of importance to the industry of nutrition, health and wellbeing within the food and drink industry. In particular the industry is seeking support in:

- Enhancing nutritional potential
- Preserving and enhancing nutritional value in processing, distribution and sale
- Delivering nutritious products that meet dietary needs
- Responding to nutritional requirements and dietary habits

This paper outlines some of the challenges facing companies aiming to grow within or enter this innovation space and proposes approaches that support the development of nutritious food and drink products.

For further information and help in this field, please contact:

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## **Introduction**

We are all acutely aware of the growing concerns surrounding our health. This is in part due to an increase in sedentary lifestyles and changes in our dietary habits. These gradual changes have led to an increase in conditions associated with diet, including obesity, Type II diabetes and cardiovascular disease. The growth in understanding within the industry and consumers has led to increased product innovation and design of menus that are 'good for you'. However, it is important to remember that consumer purchases are also driven by convenience, taste and value.

In the UK, the government is leading the Public Health Responsibility Deal, which encourages food and drink manufacturers and food service providers to sign up to pledges focused on calorie, fat, salt and sugar reduction. Reformulation of current products to contain lower levels of fat, salt and sugar is one approach; however, an increasing number of companies are innovating in the nutrition, health and wellbeing space by developing products that are inherently 'good for you' by utilising functional properties of ingredients. Some of these ingredients and associated properties have been known for some time. This innovation activity can give a company a competitive edge and USP in a growing market. It may sometimes be possible, with these functional foods, to make a specific health claim.

## **A multidisciplinary approach**

NPD is a team game. The effective NPD team takes inputs from marketers, technologists, key scientists, manufacturing specialists and the legal experts. Clearly many companies have all the expertise they need in house but, particularly in the health and wellbeing market, there are specialist inputs that support the main team with relation to specific ingredients, technologies and health claims. These are often accessed through consultancy and other external supports.

Marketing is key, not only from the point of view of consumer demand, but also in the positioning of the product alongside existing products from the company and its competitors.

Getting all the relevant inputs early on in the cycle eases the development and scale up to manufacture and also makes sure commercial success is achieved as soon as possible in these exciting markets.

## **Working within the regulations**

When designing a new food or drink product there are legislative issues to be aware of and comply with. Legislation changes frequently and keeping up to date is key to being ahead of the game in new product development (NPD). Three major areas need to be considered from a legislative point of view:

1. Are the ingredients proposed permitted for use?
2. Is the labelling lawful?
3. Once developed, is the product safe to eat within the stated shelf life?

An increasing number of companies are exploring the use of alternative ingredients that have perceived nutritional or health benefit. Regulations surrounding the use of ingredients are strict. In simple terms, it is permitted to use anything in the EU, provided that it has a history of safe use within

the EU. If it does not have a history of safe use, then it has to be treated as a novel food and forwarded for approval (in the UK) to the Advisory Committee on Novel Foods and Processes. With a growing market for functional foods, companies can gain a competitive edge by making a claim about their product. The use of an approved health claim tells consumers that your product provides a specific benefit. However, submission of a health claim dossier to the European Food Safety Authority (EFSA) can be a complex, time-consuming and expensive process. It is recommended that, prior to preparing and submitting your claim, an independent review is undertaken of the evidence you have gathered and/or produced against EFSA guidelines for submission to identify any gaps in this evidence base.

## **Ingredient functionality**

Food and drink products that claim to have beneficial health impacts are likely to contain functional ingredients in some form or another, either naturally occurring or added during processing to provide functionality that would not otherwise exist. Successful product development requires a robust understanding of the underpinning science of these ingredients and how they behave during manufacture and beyond.

When developing healthier products, there are a number of challenges to be addressed. When selecting ingredients for healthier products, it is essential to consider the effect that this may have on processing and handling, and product quality and food safety. When replacing an ingredient it is important to understand all of its functions within the product. For instance, sugar provides bulk as well as sweetness, and salt can reduce water activity, so increasing potential shelf life as well as enhancing flavour.

In recent years, as well as a drive towards reformulation of food and drinks for health, the trend has been towards the use of alternative ingredients. One example is seaweed:

Seaweeds are becoming more popular as ingredients in our diet, and algal ingredients are important in the preparation of healthy food. Health benefits of sea vegetables include: the regulation of cholesterol levels; weight loss and anti-obesity effects; antioxidant effects; the promotion of intestinal health and prebiotic activities. These effects are conferred by the high protein, vitamin and fibre contents of the marine ingredients whilst also being low in fat.

Advantages for the food processing industries include: food thickening, emulsifying, and gelling properties (vegetarian and vegan substitute for gelatin); substitute for gluten; natural food colouring and moisture preservation in meat and bread.

The results of the inclusion of marine ingredients in food can be improved properties with added health benefits, as well as reduced overall cost compared to standard ingredients.

Extract from Food and Health Innovation Service – Technology Alert

<http://www.foodhealthinnovation.com/media/31157/id-of-new-tech-aberdeen-marine-ingredients-2013.pdf>

## **Scaling up development**

Developing new products is likely to begin with small-scale bench-top work. A prototype is developed using laboratory or kitchen-scale equipment. If this stage is successful then it is ok to move on to the next stage of development.

The challenge then becomes: how to go from a small, experimental production run to produce enough material for plant trials and, eventually, consumer acceptance trials. This is known as scale-up, and is more challenging than it may first appear.

During pilot scale development, commercial equipment is used allowing production of smaller batches – meaning less waste and reduced cost. It is possible that early successes noted during bench-scale development will not work quite the same way during commercial production. Pilot scale work may highlight these and allow them to be properly considered. When designing healthy products with reduced levels of sugar, fat or salt, or increased levels of nutrients such as vitamins, minerals and fibre, initial small scale work is often undertaken at the kitchen scale. At this scale it is difficult to predict the impact of the reformulation on the product when it is finally produced in larger volumes under conditions more closely resembling commercial manufacture. Processes such as mixing, pumping, homogenisation, vacuum packing, filling, and heat processing will all have an impact on the product. Similarly with baking, it can be difficult to predict the effect of scale up from the kitchen to the test bakery.

Pilot plant development allows samples to be produced for shelf life evaluation to give more accurate information on the quality of the product at the end of its shelf life. Samples can also be used for consumer trials to gauge the acceptability of a particular formulation or to compare a low sugar, salt or fat version with a standard product.

## **Optimising your process**

Processes can be optimised from many angles. In an NPD context, this is usually about maximising the retention of key nutrients. Traditionally the retention of vitamin C has been used as a marker for heat processed product. This can be explored as part of the pilot plant stage of development. Many foods require thermal processing to ensure that the product is safe. As well as inactivation organisms of concern and creating structure in products, thermal processing can have a detrimental effect on many nutrients. Better preservation of the nutritional and sensory properties of food during thermal processing are important, particularly when designing foods for a health and wellbeing market. It is possible to optimise a process to maximise nutrient retention whilst importantly maintaining the safety of the product, e.g. where less heat is desirable – for delicate nutrients or for some novel ingredients. Another approach is to explore the use of alternative technologies. An example of a non thermal preservation process is the use of high pressure processing.

## **Pleasing your consumer**

One very important stage in product development is the opinion of the consumer. They are, after all, the market that we wish to sell the new product too. Consumer studies enable the collection of information on what the customer wants, what they think they like, what they actually like and

whether or not your product addresses that need. These studies can be used for more than just the food or drink product. The packaging is just as important.

There are a number of methods that can be used to measure consumer opinion, including qualitative consumer studies such as focus groups, depth interviews and observational studies, as well as quantitative consumer studies like hedonic tests.

Product benchmarking is often used as part of the NPD process to compare products and gauge consumer acceptability. This approach is often used when reformulating products.

Product benchmarking provides an independent, unbiased assessment of comparative product performance from the position of the 'informed consumer'. It is typically the first stage of any product assessment activity and can be seen as a fusion of both consumer and sensory activities – often identifying issues before going onto a more rigorous consumer or sensory test. A small team, experienced at judging products from a consumer's perspective, undertake these evaluations. An assessment of appearance, flavour and texture attributes is made along with an overall eating enjoyment score and value for money assessment. All samples are blind tasted and presented in accordance with an experimental design to avoid potential bias.

But what is the consumer opinion of new products, healthy products or products carrying a claim?

Although the enhanced health benefits have attracted consumers' attention, concerns about the use of artificial ingredients and the effectiveness of the proclaimed health benefits have given rise to negative attitudes towards functional products. Thus, understanding factors that influence consumers' perceptions and acceptances of functional food is essential for food and drink manufacturers when making their NPD strategies.

Significant research efforts have been put into identifying the factors that shape consumers' attitudes and consumption behaviours in respect of functional food. The main influencing factors lie in the following areas:

#### *Food carriers and functional ingredients*

Perceptions of carriers for functional food have been found to influence consumers' acceptance. Consumers see products that are intrinsically healthy, e.g. yoghurt, as credible carriers of functional food. However, it has been noted that the perceived fit between carriers and functional ingredients is also important. For example, enrichment with omega-3 was found to generate positive attitudes with spreads, but negative attitudes with yoghurt. Thus, it is suggested that functional foods should be assessed on a product-by-product basis.

#### *Health claims*

Health claims are essential to convey product health and nutritional benefits to consumers. The persuasive impact of health claims differs depending on the levels of personal involvement with the issues stated in the claims (e.g. the relevance to consumers' personal health).

### *Nutritional knowledge*

Nutritional knowledge has been shown to have great influence on dietary behaviour. Consumers with a high level of nutritional knowledge are more likely to choose functional food than those with less nutritional knowledge.

### *Sensory appeal*

Despite the health benefits offered by functional food, it is worth mentioning that sensory characteristics are always one of the main determinants of food acceptance. Previous studies suggest that consumers are hardly willing to compromise on the taste of functional foods for eventual health benefits.

### **Closing stages**

NPD is a complex process requiring many inputs to assure the commercial success of the product, NPD is the lifeblood of an innovative food and drink industry. An industry that must flex its offering to meet the evolving needs and demands of its consumers whether that be for healthier products, more convenient products or those that make effective and innovative use of packaging.

Whether you require support in nurturing and delivering on new ideas or indeed in supporting complex changes to your existing products, Campden BRI are your partner of choice.

For further information and help in this field, please contact:

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