Last week we looked at some innovations that have had a big impact in the history of food: fermentation as a food processing technique, the threshing machine and the humble fridge. This week we’re looking into the future. In this blog we’re going to look at different types of innovations currently in the pipeline that may or may not become mainstream in the coming years.

**Where do new food innovations come from?**

New food innovations can originate from lots of different places: scientists working in universities, research and development (R&D) in companies, small scale farmers and producers, as well as ideas from consumers and sometimes even science fiction writers. Some innovations in food can also come from scientific developments in unrelated fields.

There is growing interest in the idea of ‘open innovation’. Traditionally developing new products was predominantly a closed process that took place within businesses. However the idea of open innovation encourages businesses to integrate external knowledge and expertise into their processes when creating new products.

For example, over the last couple of years there has been a competition in the UK last year which challenges students to develop new eco-friendly foods. Last year the winning products included fruit and seed snacks enriched with algae for additional protein and processed without heat treatment to reduce the environmental impact; an alternative to rice made out of small/misshapen cauliflowers rejected by supermarkets; and a healthier alternative to truffle chocolates made out of carob.

**Different types of innovation**

There are many different types of innovation happening across the food supply chain. These include
technological innovations such as the ones listed in the image below.

For more information about these technologies, have a look at this report called Food Futures: From Business as Usual to Business Unusual produced by WRAP (an organisation helping businesses and individuals reduce food waste).

With so many new technologies being introduced across the food supply chain, it is easy to think that innovation is only about technology. However this isn’t the case. There are also social innovations that try to create positive change by changing people’s attitudes or encouraging people to behave differently.
To understand how technological and social innovations work to solve challenges across the food supply chain, let’s look at case studies for two problems the food system is facing.

**Case study 1: Making food last longer to reduce waste**

The problem: Almost 50% of the total amount of food thrown away in the UK comes from people’s homes and of the 7 million tonnes of food and drink we throw away each year, more than half of this could have been eaten (source). This problem has in part been created by “best before” labels on food which were introduced in the 1970s by supermarkets to protect themselves from lawsuits and promote food safety. However an unintended consequence of the labels has been an increase in food waste, as consumers’ mistake “best before” labels with “use by” dates. Packaging and processing techniques have long been used to make food last for longer. For example salads often use ‘modified atmosphere’ packaging which removes oxygen and replaces it with inert gases to slow down decay.

New technological innovations:

- Smart packaging - ‘intelligent labels’ that change colour as the product deteriorates to show how fresh it is, giving a more accurate indication of product quality
Pulsed electrical fields - a type of food processing that uses electrical impulses to inactivate micro-organisms and preserve liquids such as fruit juice and milk, with less negative impact on the taste of the product compared to thermal processing techniques that use heat - meaning that 21 day old orange juice can taste just as fresh as when it was first bought.

New social innovations:

- Regulation to scrap “best before” labels on food - last year the EU considered extending the list of foods that do not require “best before” dates to try and reduce the amount of food thrown away by consumers (source)

Case study 2: Making diets healthier

The problem: Diet is now the number one factor driving poor health in the UK, ahead of smoking (source). Changes in lifestyles and a faster pace of life has increased the consumption of convenience foods (that are often less healthy than meals cooked from scratch) and changed the way we eat, with eating ‘on the go’ becoming more common.

New technological innovations:

- Food fortification - functional foods such as pasta, rice and bread are being fortified with vitamins to help ensure consumers reach the recommended daily intakes. For example M&S announced at the end of last year that all of its bread is to be made using yeast fortified with vitamin D.
HAPIfork - an electronic fork that helps people monitor and track their eating habits, and alerts them with gentle vibrations when they are eating too fast (eating slower makes it more likely that you will feel full and not eat as much)

New social innovations:

"Nudges" to change consumer’s food shopping and consumption behaviours - scientists in the US have experimented with ways to encourage “mindful eating” that include adding mirrors onto shopping trolleys so people can see themselves as they shop, adding lines onto trolleys that indicate how much space should be filled with fruit and vegetables, and introducing placards on trolleys that tell shoppers how much fruit and vegetables other people buy
• Educating children to eat more slowly - children have often been told to eat more slowly over the years, but now there is growing awareness of the health benefits associated with chewing food more slowly as a way of controlling weight. Could this be considered a social innovation?

Tell us what you think in the comments section below:

1. What innovation examples mentioned in this article do you think will make the biggest difference to global food security?

2. What impacts (good and bad) do you think these innovations could have in the future?

3. Who do you think will benefit from these innovations?
Problem area 1: Health and Wellbeing

Diet - what we eat and drink - plays an important role in people’s health and wellbeing. In the UK diet is now the number one factor driving poor health, ahead of smoking. What people eat, how much they eat, food options available, and the information provided to help them make healthy choices can all have an influence. What problems or frustrations do you experience when trying to eat more healthily?

Tell us what you find frustrating by submitting a problem to do with health and wellbeing. To submit a problem, click on the "submit your idea" button below.

Problem area 2: Authenticity and Trust

Over the years there have been several events that have shaken public confidence in food safety and trust in the supply chain (e.g. BSE in 1990s, the horsemeat scandal in 2013). However it is not clear what the long term impacts of these scandals have been on consumer confidence in the food system. What problems or frustrations do you experience when it comes to knowing that the food you buy is safe to eat and/or trustworthy?

Tell us what you find frustrating by submitting a problem to do with authenticity and trust in food. To submit a problem, click on the "submit your idea" button below.
Problem area 3: Sustainability and Ethics

There is growing awareness that the planet’s natural resources are under pressure and that this will pose a challenge to feeding future populations. Issues such as reducing food waste are impacted both by consumer behaviours as well as inefficiencies in the food supply chain. People say they want to live sustainably and to reduce their impact on the environment, but it can be hard to make lifestyle changes. What problems or frustrations do you experience when it comes to making sustainable and/or ethical food choices?

Tell us what you find frustrating by submitting a problem to do with food sustainability and/or ethics. To submit a problem, click on the "submit your idea" button below.

Problem area 4: Lifestyles

The way we live our lives has changed over the last few decades: more women are working and some people are working longer hours or working more flexibly. As a result, managing work and family responsibilities can sometimes feel difficult and people are looking to save time when it comes to buying and preparing food. In the future demographic changes such as an ageing population in the UK and more single person households may also create new lifestyle needs. What problems or frustrations do you experience when it comes to fitting food shopping and meal preparation into your lifestyle?

Tell us what you find frustrating by submitting a problem to do with fitting food into your lifestyle. To submit a problem, click on the "submit your idea" button below.

Problem area 5: Other types of problems?
5. Other problems

Do you have a food problem that doesn't fit into the 4 areas above? Tell us!

What have we missed? If you have thought of a food related problem but it doesn't fit under any of the other areas, we still want to hear about it. Tell us what you find frustrating by submitting a food related problem. To submit a problem, click on the "submit your idea" button below.
HEALTH AND WELLBEING

How can we make health information on food less confusing?

Lots of you said that it can be confusing to understand the information about a product's nutritional content, for example when it lists calories per 100g or measures sugar in grams. This not only makes it difficult to compare products and choose the healthier one, but also to know how much sugar, salt etc. you are actually eating. "I find that if I buy goods that tells me how much sugar, salt, fat etc I find it very confusing I am sure it would help if in some way these could be explained easier. I always try to eat healthily but find the labels not explained enough." Submitted by G194533S Other problems submitted by panel members to do with confusing health information include: Manufacturers using different versions of the 'traffic light' system Ingredient names can be hard to understand or use jargon Your ideas needed: How can we make health information of food less confusing? Submit your ideas for how this problem could be tackled by new food innovation. Think about different types of innovation that could be possible: scientific/technological ideas as well as social ideas (such as regulation, skills, education and behaviour change). Feel free to use your imagination! To submit an idea, click on the "submit your idea" button below. Remember to also 'like' the ideas already submitted that you think should be priorities for further exploration!

How can we improve the nutritional content of food?

Another frequently submitted problem is around the nutritional content of processed foods - lots of you mentioned the high levels of sugar and salt used by food manufacturers. "As much as I love to cook a meal every night with fresh ingredients, sometimes when I am on the go and trying to eat healthily I will look towards buying a 'healthy' pre-made meal from the supermarket. The sugar and salt intake in these 'healthy' meals are beyond ridiculous." Submitted by Jamesfrench7 Other problems submitted by panel members to do with nutritional content included: Additives and preservatives in ready meals and convenience food Use of shellac in waxed fruit Your ideas needed: How can we improve the nutritional content of foods? Submit your ideas for how this problem could be tackled by new food innovation. Think about different types of innovation that could be possible: scientific/technological ideas as well as social ideas (such as regulation, skills, education and behaviour change). Feel free to use your imagination! To submit an idea, click on the "submit your idea" button below. Remember to also 'like' the ideas already submitted that you think should be priorities for further exploration!

How can we make healthy foods easier to find than unhealthy options?

Unhealthier foods are often more visible in supermarkets, and this can tempt people into making less healthy food choices. "I have been to a supermarket this morning and as I came through the
doors the tables to either side and ahead of me were piled high with offers for cheap scones, biscuits and cakes." Submitted by Brendaplant

Other problems submitted by panel members to do with the visibility of healthy foods include:

Need more action against companies producing unhealthy foods

Reducing the shelf space given to unhealthy products

Lack of healthy drink options in pubs

Not all supermarkets stocking 'free from' products (e.g. gluten or lactose free)

Your ideas needed: How can we make healthy foods easier to find?

Submit your ideas for how this problem could be tackled by new food innovation. Think about different types of innovation that could be possible: scientific/technological ideas as well as social ideas (such as regulation, skills, education and behaviour change). Feel free to use your imagination! To submit an idea, click on the "submit your idea" button below. Remember to also 'like' the ideas already submitted that you think should be priorities for further exploration!

How can we make healthy foods more tempting?

Healthy foods don’t always provide the same pleasure as unhealthy options and are not generally viewed as 'comfort foods'. This is a problem as eating is supposed to be an enjoyable activity, and healthy eating can therefore sometimes feel like a chore. "I find it tricky to find snacks which are tempting enough to keep me away from the pile of communal choccies and sweets which are always near my desk!" Submitted by Sianfording

Other problems submitted by panel members to do with making healthy foods more tempting include:

Healthy food not having attractive packaging

Your ideas needed: How can we make healthy foods more tempting?

Submit your ideas for how this problem could be tackled by new food innovation. Think about different types of innovation that could be possible: scientific/technological ideas as well as social ideas (such as regulation, skills, education and behaviour change). Feel free to use your imagination! To submit an idea, click on the "submit your idea" button below. Remember to also 'like' the ideas already submitted that you think should be priorities for further exploration!

How can we make it easier for children to eat healthily?

It can be difficult making sure that children eat healthily: even with the best intentions, finding the time to make healthy meals all of the time can be difficult when parents are working and it can also be hard buying children healthy convenience food when out and about with them. "I have a young child and let’s face it however organised I would like to be, some days time gets the better of me and I have to buy convenience food for my daughter. It is very frustrating to not be able to source any relatively healthy convenience food." Submitted by Stephaniejones

Other problems submitted by panel members to do with feeding children healthily include:

Educating children to have healthy food habits

Unhealthy food in schools

Advertising unhealthy foods to children

Your ideas needed: How can we make it easier for children to eat healthily?

Submit your ideas for how this problem could be tackled by new food innovation. Think about different types of innovation that could be possible: scientific/technological ideas as well as social ideas (such as regulation, skills, education and behaviour change). Feel free to use your imagination! To submit an idea, click on the "submit your idea" button below. Remember to also 'like' the ideas already submitted that you think should be priorities for further exploration!
AUTHENTICITY AND TRUST

How can we know what happens to food in the supply chain?

Unless we grow food ourselves, we don't really know what happens to it during the food chain (e.g. what happens to it before we buy it). This means it can be difficult to trust the food on our plates. "I think if you buy fresh meat and fresh fruit and veg it's easier to believe they aren't filled with God knows what but unless you were to track the goods from planting/or field to shelf you could never really know exactly what you're eating, what extra additives it contains or what chemicals have been used on it." Submitted by Leggyno9

Other problems submitted by panel members to do with lack of certainty about what happens to food include:
- General mistrust of big agribusiness companies and manufacturers
- Lack of trust in safety and standards of food from other countries
- Contradictory information about what is safe to eat
- Safety of tinned foods
- Responsiveness of companies to food scares and how they communicate with consumers when their products need to be withdrawn

Your ideas needed: How can we reduce the lack of certainty about what happens to food in the supply chain?
Submit your ideas for how this problem could be tackled by new food innovation. Think about different types of innovation that could be possible: scientific/technological ideas as well as social ideas (such as regulation, skills, education and behaviour change). Feel free to use your imagination!
To submit an idea, click on the "submit your idea" button below. Remember to also 'like' the ideas already submitted that you think should be priorities for further exploration!

How can we increase consumers’ access to product information?

Some of you submitted problems to do with missing product information: important information about the food product that is not currently listed on products as standard. For example, manufacturers label where the food was processed but not where the ingredients are from. Or listing their product's nutritional content but not what pesticides or chemicals that the ingredients have come in contact with. Other problems submitted by panel members to do with access to product information:
- Information about ingredients when eating out in a pub or restaurant

Your ideas needed: How can we increase consumers' access to product information?
Submit your ideas for how this problem could be tackled by new food innovation. Think about different types of innovation that could be possible: scientific/technological ideas as well as social ideas (such as regulation, skills, education and behaviour change). Feel free to use your imagination!
To submit an idea, click on the "submit your idea" button below. Remember to also 'like' the ideas already submitted that you think should be priorities for further exploration!

How can we make product labelling easier to understand?

Lots of you submitted problems around food labelling not being clear or easy to understand, which can make it difficult to compare products. Product origin, processing techniques, animal welfare standards and food miles were all things you mentioned as not being very clear. Other problems submitted by panel members to do with product labelling include:
- Not knowing what the different
food standards & certifications mean (e.g. the Red Tractor, Soil Association, Rainforest Alliance, Red Lion and Fairtrade logos sometimes found on packaging) Your ideas needed: How can we make product labelling easier to understand? Submit your ideas for how this problem could be tackled by new food innovation. Think about different types of innovation that could be possible: scientific/technological ideas as well as social ideas (such as regulation, skills, education and behaviour change). Feel free to use your imagination! To submit an idea, click on the "submit your idea" button below. Remember to also 'like' the ideas already submitted that you think should be priorities for further exploration!

How can we stop misleading product claims?

People can be suspicious of the claims made by food manufacturers about their products, and some of you mentioned that companies can make either deliberately untruthful claims or claims that are confusing. "Even when packaging is supposed to be clearly labelled it is not always clear what is in the products and, in cases such as the horse meat scandal, there appear to have been deliberate misinformation." Submitted by Joy Other problems submitted by panel members to do with misleading product claims include: Lack of certainty about what 'organic' actually means - marketing myth? Misleading health labelling (e.g. does '10% fat free' mean 90% fat) Finding traces of animal DNA on food labelled as vegetarian Your ideas needed: How can we stop misleading product claims? Submit your ideas for how this problem could be tackled by new food innovation. Think about different types of innovation that could be possible: scientific/technological ideas as well as social ideas (such as regulation, skills, education and behaviour change). Feel free to use your imagination! To submit an idea, click on the "submit your idea" button below. Remember to also 'like' the ideas already submitted that you think should be priorities for further exploration!

SUSTAINABILITY AND ETHICS

How can we reduce the amount of food waste?

Many of you submitted problems around the issue of food waste. Food waste is a problem both in the supply chain (e.g. supermarkets discarding misshapen fruit & veg) as well as in our homes (e.g. consumers throwing away food that could be eaten). "Food wastage is encouraged by the supermarkets. 3 for 1 type of deals lure people in to buying more than they can possibly use before the use by date." Submitted by Rob Other problems submitted by panel members to do with food waste include: Supermarkets discarding 'wonky' fruit and vegetables' Use by' and 'sell by' dates causing people to throw away food People throwing away food because there's a lack of peer pressure or because they're not aware of the consequences People not knowing how to reuse leftovers Packaged food sold in too large quantities (e.g. person trying to buy food just for themselves having to buy a family sized portion) 'Buy more, save more' deals and 'reduced to clear' practices by supermarkets creating waste Unnecessary amounts of packaging Your ideas needed: How can we reduce the amount of food waste? Submit your ideas for how this problem could be tackled by new food innovation. Think about different types of innovation that could be possible: scientific/technological ideas as well as social ideas (such as regulation, skills, education and
How can we make the food & meat industry more sustainable and ethical?

The food industry in many parts of the world can have a negative impact on the environment. Many of you talked about the meat industry in particular, both in terms of the consequences for animal welfare and sustainability. "Many people are not aware of how much more water is required to produce beef as against grains. Many wouldn't believe it. This is just one example of wastage. Grains that should go directly to starving people in third world countries, go instead to farm animals, just so they can be fattened up quicker, so they can be killed quicker. It really is that simple. And all for a burger!" Submitted by CoconutWater

Other problems submitted by panel members to do with the negative environmental consequences of the food industry include:

- Water usage
- Lack of incentives for companies and supermarkets to act sustainably
- Unsustainable farming practices
- Use of insecticides
- Palm oil

Your ideas needed: How can we make the food and/or meat industry more sustainable and ethical?

Submit your ideas for how this problem could be tackled by new food innovation. Think about different types of innovation that could be possible: scientific/technological ideas as well as social ideas (such as regulation, skills, education and behaviour change). Feel free to use your imagination! To submit an idea, click on the "submit your idea" button below. Remember to also 'like' the ideas already submitted that you think should be priorities for further exploration!

How can we improve the livelihoods of farmers?

Farmers, fishermen and other people working to produce and distribute food do not always have very good working conditions, and do not always get paid a lot of money. "Your ethical product or fair trade product may treat the farmer more fairly, but how sure can we be that the whole supply chain follows the same fair trade policies. No one knows how well the deck hand on the ship is actually treated by the ships captain once the ship has left harbour" Submitted by Michael

Other problems submitted by panel members to do with the livelihoods of food producers include:

- Supermarkets not treating farmers fairly
- Sugar farmers' livelihoods would be negatively impacted if sugar consumption decreases
- Difficult knowing who to support - is it better supporting local businesses in the UK or small low paid communities abroad?

Your ideas needed: How can we improve the livelihoods of farmers and other people working in food production and distribution?

Submit your ideas for how this problem could be tackled by new food innovation. Think about different types of innovation that could be possible: scientific/technological ideas as well as social ideas (such as regulation, skills, education and behaviour change). Feel free to use your imagination! To submit an idea, click on the "submit your idea" button below. Remember to also 'like' the ideas already submitted that you think should be priorities for further exploration!

How can we increase the availability of sustainable food?

The availability of sustainable food is a problem for many people around the world. In many developing countries, the issue is growing more food sustainably to feed a growing population and
ensuring that food gets distributed fairly. For those of us living in the UK, the issue is often the price of sustainable/ethical food and not all supermarkets stocking sustainably sourced food. 'Sustainable food' is not just organic or Fairtrade food - it's food that is produced with minimal detrimental impacts on the environment. "USA 5% of world population but consume about 60% of world resources. We should play fair." Submitted by AeroFord1

Other problems submitted by panel members to do with access to food include: Feeding a growing population Ensuring countries that export food have enough to feed their own populations Your ideas needed: How can we increase the availability of sustainable foods (in the UK or abroad)? Submit your ideas for how this problem could be tackled by new food innovation. Think about different types of innovation that could be possible: scientific/technological ideas as well as social ideas (such as regulation, skills, education and behaviour change). Feel free to use your imagination! To submit an idea, click on the "submit your idea" button below. Remember to also 'like' the ideas already submitted that you think should be priorities for further exploration!

How can we reduce food miles?

Importing food from around the world and transporting it over long distances means that food can have a big carbon footprint. "Why is there so much food being flown around the world??. This seems to go on 7 days a week, 365 days a year, so imagine the carbon footprint of all this flying asparagus etc!!" Submitted by Alanrp123

Other problems submitted by panel members to do with importing food include: Food miles of health food fads such as quinoa Not know what foods are in season UK not self-reliant enough in food production Your ideas needed: How can we reduce the carbon footprint of food? Submit your ideas for how this problem could be tackled by new food innovation. Think about different types of innovation that could be possible: scientific/technological ideas as well as social ideas (such as regulation, skills, education and behaviour change). Feel free to use your imagination! To submit an idea, click on the "submit your idea" button below. Remember to also 'like' the ideas already submitted that you think should be priorities for further exploration!

LIFESTYLES

How can we make food more sociable?

For a long time eating together has been a way of creating bonds between people, and yet eating food seems to be becoming less of a social activity. "This seems to be something we do less of - cooking for each other, and eating together. I don't mean in restaurants, I mean as a family, as friends - just enjoying food" Submitted by CRedmondNI

Other problems submitted by panel members to do with food becoming less sociable include: Colleagues eating lunch together at work Your ideas needed: How can we make food more sociable? Submit your ideas for how this problem could be tackled by new food innovation. Think about different types of innovation that could be possible: scientific/technological ideas as well as social ideas (such as regulation, skills, education and behaviour change). Feel free to use your imagination! To submit an idea, click on the "submit your idea" button below. Remember to also 'like' the ideas already submitted that you think should be priorities for further exploration!
How can we reduce the time it takes to prepare meals in the evenings?

This is a problem that many people submitted! Preparing food in the evenings and cooking from scratch can take time, which is difficult if you're coming back from work tired and/or have a hungry family to feed. "I have always tried to cook fresh food for my family. When I was an at home mother it was easy to shop & cook fresh but when I went back to work it became more difficult. Shopping for fresh food was ok but unfortunately our eating time suffered." Fifithorne

Other problems submitted by panel members to do with the time it takes to cook include: Cooking in bulk to make multiple meals The time it takes to prepare vegetables Perception that meals with meat are quicker and easier to prepare than vegetarian options

Your ideas needed: How can we reduce the time it takes to prepare meals in the evening? Submit your ideas for how this problem could be tackled by new food innovation. Think about different types of innovation that could be possible: scientific/technological ideas as well as social ideas (such as regulation, skills, education and behaviour change). Feel free to use your imagination! To submit an idea, click on the "submit your idea" button below. Remember to also 'like' the ideas already submitted that you think should be priorities for further exploration!

How can we make shopping for food easier?

People often have routines, such as doing a weekly food shop at the weekends. However if these routines get disrupted it can be difficult to get the shopping done, meaning people have less fresh food to make meals with during the week. "I meal plan and shop at the weekend: however if I happen to be away I then won't be able to do my weekly food shop which means I have to then buy limited ingredients from the local which is more expensive - this effects my food budget as I tend to then go over, and can't always do the meal I planned because the food is not in stock." Submitted by Bethan Hamilton

Other problems submitted by panel members to do with food shopping include: Keeping track of household budgets and expenditure on food Opening times of shops Finding the time to go to the supermarket

Your ideas needed: How can we make shopping for food easier? Submit your ideas for how this problem could be tackled by new food innovation. Think about different types of innovation that could be possible: scientific/technological ideas as well as social ideas (such as regulation, skills, education and behaviour change). Feel free to use your imagination! To submit an idea, click on the "submit your idea" button below. Remember to also 'like' the ideas already submitted that you think should be priorities for further exploration!

How can we make it easier to plan meals?

It can be difficult to think ahead and plan meals so they fit into our lifestyles, making it more likely that we spend more on convenience food. "It can be so difficult to make a healthy food option with being so busy our lifestyles have changed throughout the decades and now we need to plan more for the meals we wish to make. This was never a problem for my mum who seemed to always be in the kitchen!" Submitted by Beckie

Other problems submitted by panel members to do with meal planning include: Not having the time to cook in the evenings Not having time at the weekends to
cook meals in advance No cookbooks for how to cook in bulk
Your ideas needed: How can we make it easier to plan meals?
Submit your ideas for how this problem could be tackled by new food innovation. Think about different types of innovation that could be possible: scientific/technological ideas as well as social ideas (such as regulation, skills, education and behaviour change). Feel free to use your imagination!
To submit an idea, click on the "submit your idea" button below. Remember to also 'like' the ideas already submitted that you think should be priorities for further exploration!
IDEA 1: "Sexy standardised supermarket scanners"

One of the four ideas pitched at the Harrogate workshop. The problem: Too much variation in nutritional information. The idea: Some people are using mobile phones to find nutritional information but not everyone has a phone, so bring scanners into supermarkets. Shoppers can use these scanners to bring up simple, standardised information about a product's nutritional content that comes up immediately, with the option to click and get more information. It will be simple enough for children to use so they can learn about which products are healthy too. What do you think about this idea?

IDEA 2: "A voluntary obligation on retailers to purchase UK produce over imported food"

One of the four ideas pitched by the Food Futures participants at the Harrogate workshop. The problem: How can we increase the availability of sustainable food in the UK? We are now aware that the UK is becoming less able to feed itself, statistics show imports are reducing. The idea: Introduce a voluntary obligation on retailers to purchase food grown in the UK over imported produce. If the voluntary obligation fails then regulation should be brought in. It would likely lead to increased food prices but it would mean fresher and better quality produce, reduced transportation of food, more traceable products, and would support the local economy. What do you think about this idea? Would you support it even if it meant higher food prices?

IDEA 3: "Educate communities about food and lifestyle"

One of the four ideas pitched by Food Futures participants at the Harrogate workshop. The problem: Changing people's food preferences and habits. The idea: It's hard to change individual people's habits so target education at communities. What do you think about this idea? How can we get around the problem that people do not always change their behaviours even when they have already been educated and know that they should be eating more healthily?

IDEA 4: "Educate children about the basics of food through games"

One of the four ideas pitched by Food Futures participants at the Harrogate workshop. The problem: We don't always know what goes into the food that children eat, and parents can make poor choices when deciding what to feed their children. The idea: Design a game that educates children about the basics of food to engage children in their food. What do you think about this idea?
IDEA 5: "Add nutrients to flour at the growing or processing stages"

One of the four ideas pitched by Food Futures participants at the Dundee workshop. The problem: How to safely improve the nutritional content of food so that it benefits the widest range of people. The idea: Flour is an ingredient that goes into a lot of different foods such as bread, cakes and pastry that many people eat. In the same way that a lot of tap water is fluoridated to help prevent tooth decay, wheat could be grown to have more nutrients (e.g. through GM) or nutrients added to flour during processing to increase its nutritional value. What do you think about this idea? Would you rather wheat be grown to have more nutrients in the plant or for nutrients to be added once it had already been processed into flour?

IDEA 6: "Saga meals" - meals adapted to older people's nutrition

One of the ideas pitched by Food Futures participants at the Dundee workshop. The problem: How to ensure food meets the needs of an ageing UK population. The idea: Ready meals and ingredients with additional nutrients of benefit for older people e.g. Omega 3 for brains or calcium for bone health. What do you think about this idea? How could it be marketed so that it wasn’t offensive to older people?

IDEA 7: "Use renewable energy to produce local food"

One of the four ideas submitted by Food Futures participants at the Dundee workshop. The problem: How to make farming practices more sustainable. The idea: Use renewable energy such as wind turbines on farms to produce more local food. What do you think about this idea?

IDEA 8 - "Booklet or app to explain food labelling"

One of the four ideas pitched by Food Futures participants at the Dundee workshop. The problem: Lack of understanding about the salt, sugar and fat content in food. The idea: Standardise the information available using universal visual symbols. Send out booklets to every household and offer free apps so people know what the symbols mean. What do you think about this idea?

IDEA 9 - Use genome editing on crops to increase availability

An idea submitted by the Biotechnology & Biological Sciences Research Council. Genome editing could be one way to increase the availability of sustainable foods as it is fast, precise, relatively simple and far cheaper than GM or conventional breeding techniques. To learn more about genome editing, have a look at the description below and/or the Guardian article. What do you think about this idea? Would you eat food produced from crops that have been genome edited? https://www.theguardian.com/science/2016/feb/07/ge...ABOUT GENOME EDITINGGenome editing™ is a relatively new technology, which refers to techniques that enable precise genetic
changes to be made to genetic information, such as adding, removing or replacing DNA at specific locations, or switching genes on and off while the DNA sequence remains unchanged. Genome editing technologies have hit the headlines for their potential use in human medicine — making personalized medicine a reality and enabling the production of cheaper pharmaceuticals. More contentiously, they also offer the chance to alter human embryos to prevent serious genetic diseases. Across agriculture and food too genome editing techniques offer huge potential, with many in the scientific community heralding it as a “game-changing” technology, as it is fast, precise, relatively simple and far cheaper than GM or conventional breeding techniques. Genome editing techniques differ from Genetically Modified (GM) organisms, as these new techniques usually involve adapting an organism’s existing DNA rather than inserting a completely new gene from another organism as in GM. In the future, genome editing could be used across the food chain, from field to fork, from producing disease resistant crops and livestock through to the production of hypo allergic peanuts and nutritionally enhanced food. Unlike GM, if an organism has had its gene edited, this change cannot be traced. Supporters of these techniques say this is because the process is more like what happens in conventional plant breeding, only it enables the changes to happen in hours rather than years. While opponents argue that lack of traceability is a major consumer issue. Currently genome editing technologies are only used as scientific tools. The regulation around them is currently being looked at by the European Commission who are due to rule imminently on whether these new technologies should be treated the same as Genetically Modified Organisms. Such a ruling would make taking these technologies out of the lab and developing them for real world applications very difficult, expensive and time consuming. While supporters of genome editing highlight the precision these techniques involve, opponents are concerned about unpredictable and unexpected results.

IDEA 10: "Rent a granny" to show how to cook healthy meals

One of the ideas submitted by a Food Futures panel member selected by our specialists. The problem: How can we help people know how to make healthy meals? The idea: "With all the lonely old folk out there i.e.: grandma left alone (after grandpa’s shuffled of his mortal coil), it cant be that difficult to offer company/warmth & a shared meal experience for the family to ask for a cookery class/meal in exchange for the aforementioned, (most of the old folk know a thing or two about healthy eating otherwise they wouldn’t be "old folk")" - submitted by Gren in the online innovation challenge. What do you think about this idea?

IDEA 11 - Use science to make foods more nutritious

One of the ideas submitted by a Food Futures panel member selected by our specialists. The problem: How can we improve the nutritional content of food? The idea: "I think any improvement in the nutritional value of food will come from both scientific research into developing more nutritional foods as well as looking at other foods that can be eaten, such as insects. GM crops will likely become a widespread reality but hopefully only after rigorous testing has been carried out to find out what, if any, side effects there are." - submitted by Joy. What do you think about this idea? What are the benefits/disadvantages of using science vs. nature to improve nutritional content?
IDEA 12 - New sources of protein

An idea submitted by Defra
The problem: How to make food production more sustainable and feed a growing population
The idea: Develop new alternative sources of protein (e.g. insects, seaweed, in-vitro meat grown in labs)
What do you think about this idea? How can we make new and unfamiliar sources of protein more appealing?
Discussion guides

This part of the activity involves two half-day workshops, one each in Harrogate (20th Feb) and Dundee (27th Feb). This document sets out each stage of the workshop and forms a discussion guide for facilitators. The questions included in the guide are not used verbatim by facilitators but provide a loose structure for them to follow, whilst also allowing them to respond to and incorporate participants’ views as the discussion continues. Facilitators are briefed on the overall objective of the discussion and what each question is seeking to elicit, which enables them to tailor the questions they do ask appropriately. We will aim to be responsive to the points participants make, and to keep the discussion flowing as naturally as possible.

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A creative exercise to start the day and capture scope of participants understanding |
| 10.30 – 11.30 | Problem space carousel: tour of 4 problem spaces for innovation  
Participants move round the room in groups and are introduced to different problem spaces & associated ideas generated from online Challenge activity. 1st voting exercise – which problem will make the biggest difference to global food security |
| 11.30 – 11.45 | Coffee break |
| 11.45 – 12.05 | Innovation questions: video interview with Ian Noble, R&D Director at PepsiCo  
Discussion of innovation process and perceptions as to who benefits and likely impacts of the case study |
| 12.05 – 13.20 | Innovation priorities: idea development and consideration of possible impacts  
Each group works on one problem space and considers the different ideas in pairs – what aspects do they like/dislike and why, who will benefit and potential impacts. Group develops a pitch for the idea they have prioritised. Whole group discussion to share each group’s conclusions for the ideas considered in their problem space. |
| 13.20 – 13.30 | Thanks and close |
**Detailed process plan**

**Part 1: Introductions & welcome, and what does ‘innovation’ mean?**

**Research questions:**

- What do participants understand by innovation and how do they understand its role in global food security?
- What are their perceptions of what makes something innovative?

**Materials:**

- Coloured dots to allocate people and specialists to tables (different coloured dots for each table)
- Back-up examples of innovation on each table for facilitators to use in case participants have not bought their own examples.

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| **10.00 – 10.15** | **Lead facilitator: open the workshop**  
Objectives, overview of agenda, ground rules, ask observers/specialists to introduce themselves. Explain we would like to record discussions. | Presentation with this info |
| **10.15 – 10.30** | **Introductions at small tables combined with innovation ‘show and tell’**  
**Table facilitators:** Ask those at your table to go round in turn and 1) Introduce themselves 2) Show the table what they bought in from home as an example of something ‘innovative’ (participants have been asked to bring in a small object or photo (either food or non-food related). Ask them to explain what makes it innovative. Record on pro-forma 1.  
**Table facilitators:** Brief small table discussion after everyone has shown their object; ask group which of the objects shown do they think:  
- Could have the biggest impact on people’s lives in UK (how they purchase and consume | **TURN ON RECORDER** Get to know each other: name, what object/photo they bought in, what about it makes it ‘innovative’  
Each facilitator to have 4 ‘back-up’ objects in case participants haven’t bought in anything (e.g. newish innovations such as Zero calorie coke and ‘traffic light’ labelling, and old innovations such as a fork and tinned food). Facilitator to ask what makes/made these things innovative and why. |
### Part 2: What are the problems new food innovation should address?

**Research questions:**

- What ‘problem spaces’ (e.g. consumer and societal unmet needs impacting global food security) are priorities for participants?

**Materials**

- Problem space stimulus stuck on walls by theme: Health & Wellbeing, Authenticity & Trust, Sustainability & Ethics, and Lifestyles
- Coloured dots for voting exercise
- Whistle (for lead facilitator to call time for groups to move onto next problem space)

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| | • Here are the problems that were submitted online. Which one do you think is most important for new food innovation to tackle? [Ask participants to put dot on most important problem and explain their choice] | |
| | • Ask specialists to say which problem they would have voted for and why (after everyone else has voted). Ask participants for any comments on what specialists have just said. | |
| 11:30 – 11:45 | Coffee break | TURN OFF RECORDER

### Part 3: What are the priorities for innovation and who benefits?

**Research questions:**

- What types of innovation in the food chain (e.g. novel technologies and low-tech or behavioural solutions) do participants support and why?
- Are there spaces in the food chain where participants oppose technological innovation – the ‘red lines’ of innovation?
- Taking a consumer/citizen led approach to innovation, where in the food chain do participants want to see new innovation?
- Do participants feel consumer preferences and societal challenges are reflected in new food innovation?
- What do they see as the benefits of innovation and who do they think benefits?

**Materials**

- Video loaded onto laptop and projector
- Pro forma 2 – 3 x templates to be completed by pairs for appraising ideas (per table)
- Pro forma 3 – 1 x pitch template to be completed by group

### Timing | Activity / questions | Facilitator notes
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| 11.45 – 12.05 | **Lead facilitator:** Introduce the video case study
- Before playing video, explain this is an interview with Ian Noble, Chair of the Food Innovation Network and Director of Innovation at PepsiCo. | Participants to sit in pre-assigned tables (still 4 tables but different from the morning, list on wall where coffee is to show new table
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for technology – where might technology would be off-putting to consumers?

- What benefits (and disadvantages) could this innovation have for:
  - For individual consumers in UK
  - For wider society?

### Close session

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| 13.00 – 13.20 | **Lead facilitator:** Plenary discussion  
Lead facilitator takes 4 x Pitch pro-formas and sticks to wall.  
Invite each table to share their pitch and ask for reflections from group (max 5 minutes per pitch)  
Lead facilitator to ask room to vote for the innovation they think is the priority for food innovation. Vote via show of hands. |                                                                                     |
| 13.20 – 13.30 | Thanks from PMT and facilitators. Ask participants to complete evaluation forms and hand in for incentives. | **TURN OFF DIGITAL RECORDER**  
Facilitators: make sure everyone has evaluation form |
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Lead facilitator takes 4 x Pitch pro-formas and sticks to wall.  
Invite each table to share their pitch and ask for reflections from group (max 5 minutes per pitch)  
Lead facilitator to ask room to vote for the innovation they think is the priority for food innovation. Vote via show of hands. |                   |
| 13.20 – 13.30 | Thanks from PMT and facilitators. Ask participants to complete evaluation forms and hand in for incentives.                                                                                                         | TURN OFF DIGITAL RECORDER  
Facilitators: make sure everyone has evaluation form |