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1. Achieved samples

London pilot group discussions (2)

Total number of participants	16
Age	
18-25	4
26-35	4
36-49	4
50+	4
Gender	
Female	8
Male	8
Household composition	
Single, no children	4
Couple, no children	4
Parents (Single or Couple with children)	4
Empty nester (Single or Couple)	4
Ethnic background	
BME	7
European	1
White British	8
Educational level	
No formal qualifications	2
GCSE / A level or equivalent	10
Degree / professional qualification	4
Diet	
No special requirements	12
Vegetarian	2
Religious dietary requirement	2
Location	
Urban	8
Suburban	8

Public dialogues in London, Cardiff and Paisley

	London	Cardiff	Paisley	Total
Total number of participants	16	17	16	49
Age				
18-25	3	3	3	9
26-35	3	4	3	10
36-49	4	4	4	12
50-65	4	4	4	12
65+	2	2	2	6
Gender				
Female	8	8	8	24
Male	8	9	8	25
Social grade				
ABC ¹	9	11	9	29
C ² DE	7	6	7	20
Household composition				
Single, no children	4	3	3	10
Couple, no children	2	4	3	9
Parents (Single or Couple with children)	6	6	5	17
Empty nester (Single or Couple)	4	4	5	13
Ethnic background				
BME	6	3	2	11
White British	10	14	14	38
Educational level				
No formal qualifications	2	2	2	6
GCSE or equivalent	4	4	4	12
A level or equivalent	5	6	5	16
Degree / professional qualification	5	5	5	15
Location				
Urban / Suburban	8	10	10	28
Rural	8	7	6	21

Follow-up interviews in London, Cardiff and Paisley

	London	Cardiff	Paisley	Total
Total number of participants	5	9	6	20
Age				
18-25	1	0	0	1
26-35	1	2	1	4
36-49	2	2	2	6
50-65	1	3	2	6
65+	0	2	1	3
Gender				
Female	4	7	3	14
Male	1	2	3	6
Social grade				
ABC ¹	3	6	4	13
C ² DE	2	3	2	7
Household composition				
Single, no children	1	1	1	3
Couple, no children	2	3	2	7
Parents (Single or Couple with children)	1	2	2	5
Empty nester (Single or Couple)	1	3	1	5
Ethnic background				
BME	2	2	1	5
White British	3	7	5	15
Educational level				
No formal qualifications	1	1	1	3
GCSE or equivalent	0	2	2	4
A level or equivalent	2	2	1	5
Degree / professional qualification	2	4	2	8
Location				
Urban / Suburban	5	6	4	15
Rural	0	3	2	5

Definition of location

London:

- Urban locations included: Chiswick, Fulham, Tottenham, Hammersmith, Bermondsey, Islington and Finsbury Park
- Suburban locations included: Boreham Wood, Potters Bar, Barnet, Surbiton, Loughton, Bushey, Leytonstone and Croydon

Cardiff:

- Urban locations included: Cardiff city
- Rural locations included: any town or village outside Cardiff city centre

Paisley:

- Urban locations included: Paisley town centre
- Rural locations included: any town or village location outside Paisley including Lochwinnoch, Johnstone and Kilmacolm

2. Homework task to be completed prior to Day 1

FOOD RESEARCH TASK

Thank you for agreeing to participate in this research.

We would like you to complete this task when you have just finished a grocery shop. Please make sure you have all the shopping with you and your receipt. Please look at your receipt and note down your responses to the following questions for at least 10 different **food/drink items**:

Item I bought	Is this something you always buy (i.e. routine), an impulse buy (impulse) or something you thought more about (i.e. choice)? – please circle	Were there any specific reasons why you chose this product over another?	Did any of the following come into your decision making on this? Tick as appropriate
<i>e.g. Tesco frozen raspberry pavlova</i>	Routine / Choice / Impulse	<i>e.g. My son likes raspberry pavlova, it's a treat for his birthday</i>	<input type="checkbox"/> Healthy eating <input type="checkbox"/> Quality <input type="checkbox"/> Price <input type="checkbox"/> Taste <input type="checkbox"/> Animal welfare, e.g. free range <input type="checkbox"/> Buying organic food <input type="checkbox"/> Environmental impact <input type="checkbox"/> Buying fair trade <input type="checkbox"/> Buying British <input type="checkbox"/> Trust in food safety <input type="checkbox"/> Buying food in season <input type="checkbox"/> Buying locally produced food <input type="checkbox"/> None of these

	Routine / Choice / Impulse		<input type="checkbox"/> Healthy eating <input type="checkbox"/> Quality <input type="checkbox"/> Price <input type="checkbox"/> Taste <input type="checkbox"/> Animal welfare, e.g. free range <input type="checkbox"/> Buying organic food <input type="checkbox"/> Environmental impact	<input type="checkbox"/> Buying fair trade <input type="checkbox"/> Buying British <input type="checkbox"/> Trust in food safety <input type="checkbox"/> Buying food in season <input type="checkbox"/> Buying locally produced food <input type="checkbox"/> None of these
	Routine / Choice / Impulse		<input type="checkbox"/> Healthy eating <input type="checkbox"/> Quality <input type="checkbox"/> Price <input type="checkbox"/> Taste <input type="checkbox"/> Animal welfare, e.g. free range <input type="checkbox"/> Buying organic food <input type="checkbox"/> Environmental impact	<input type="checkbox"/> Buying fair trade <input type="checkbox"/> Buying British <input type="checkbox"/> Trust in food safety <input type="checkbox"/> Buying food in season <input type="checkbox"/> Buying locally produced food <input type="checkbox"/> None of these
	Routine / Choice / Impulse		<input type="checkbox"/> Healthy eating <input type="checkbox"/> Quality <input type="checkbox"/> Price <input type="checkbox"/> Taste <input type="checkbox"/> Animal welfare, e.g. free range <input type="checkbox"/> Buying organic food <input type="checkbox"/> Environmental impact	<input type="checkbox"/> Buying fair trade <input type="checkbox"/> Buying British <input type="checkbox"/> Trust in food safety <input type="checkbox"/> Buying food in season <input type="checkbox"/> Buying locally produced food <input type="checkbox"/> None of these

	Routine / Choice / Impulse		<input type="checkbox"/> Healthy eating <input type="checkbox"/> Quality <input type="checkbox"/> Price <input type="checkbox"/> Taste <input type="checkbox"/> Animal welfare, e.g. free range <input type="checkbox"/> Buying organic food <input type="checkbox"/> Environmental impact	<input type="checkbox"/> Buying fair trade <input type="checkbox"/> Buying British <input type="checkbox"/> Trust in food safety <input type="checkbox"/> Buying food in season <input type="checkbox"/> Buying locally produced food <input type="checkbox"/> None of these
	Routine / Choice / Impulse		<input type="checkbox"/> Healthy eating <input type="checkbox"/> Quality <input type="checkbox"/> Price <input type="checkbox"/> Taste <input type="checkbox"/> Animal welfare, e.g. free range <input type="checkbox"/> Buying organic food <input type="checkbox"/> Environmental impact	<input type="checkbox"/> Buying fair trade <input type="checkbox"/> Buying British <input type="checkbox"/> Trust in food safety <input type="checkbox"/> Buying food in season <input type="checkbox"/> Buying locally produced food <input type="checkbox"/> None of these
	Routine / Choice / Impulse		<input type="checkbox"/> Healthy eating <input type="checkbox"/> Quality <input type="checkbox"/> Price <input type="checkbox"/> Taste <input type="checkbox"/> Animal welfare, e.g. free range <input type="checkbox"/> Buying organic food <input type="checkbox"/> Environmental impact	<input type="checkbox"/> Buying fair trade <input type="checkbox"/> Buying British <input type="checkbox"/> Trust in food safety <input type="checkbox"/> Buying food in season <input type="checkbox"/> Buying locally produced food <input type="checkbox"/> None of these

	Routine / Choice / Impulse		<input type="checkbox"/> Healthy eating <input type="checkbox"/> Quality <input type="checkbox"/> Price <input type="checkbox"/> Taste <input type="checkbox"/> Animal welfare, e.g. free range <input type="checkbox"/> Buying organic food <input type="checkbox"/> Environmental impact	<input type="checkbox"/> Buying fair trade <input type="checkbox"/> Buying British <input type="checkbox"/> Trust in food safety <input type="checkbox"/> Buying food in season <input type="checkbox"/> Buying locally produced food <input type="checkbox"/> None of these
	Routine / Choice / Impulse		<input type="checkbox"/> Healthy eating <input type="checkbox"/> Quality <input type="checkbox"/> Price <input type="checkbox"/> Taste <input type="checkbox"/> Animal welfare, e.g. free range <input type="checkbox"/> Buying organic food <input type="checkbox"/> Environmental impact	<input type="checkbox"/> Buying fair trade <input type="checkbox"/> Buying British <input type="checkbox"/> Trust in food safety <input type="checkbox"/> Buying food in season <input type="checkbox"/> Buying locally produced food <input type="checkbox"/> None of these
	Routine / Choice / Impulse		<input type="checkbox"/> Healthy eating <input type="checkbox"/> Quality <input type="checkbox"/> Price <input type="checkbox"/> Taste <input type="checkbox"/> Animal welfare, e.g. free range <input type="checkbox"/> Buying organic food <input type="checkbox"/> Environmental impact	<input type="checkbox"/> Buying fair trade <input type="checkbox"/> Buying British <input type="checkbox"/> Trust in food safety <input type="checkbox"/> Buying food in season <input type="checkbox"/> Buying locally produced food <input type="checkbox"/> None of these

	Routine / Choice / Impulse		<input type="checkbox"/> Healthy eating <input type="checkbox"/> Quality <input type="checkbox"/> Price <input type="checkbox"/> Taste <input type="checkbox"/> Animal welfare, e.g. free range <input type="checkbox"/> Buying organic food <input type="checkbox"/> Environmental impact	<input type="checkbox"/> Buying fair trade <input type="checkbox"/> Buying British <input type="checkbox"/> Trust in food safety <input type="checkbox"/> Buying food in season <input type="checkbox"/> Buying locally produced food <input type="checkbox"/> None of these
	Routine / Choice / Impulse		<input type="checkbox"/> Healthy eating <input type="checkbox"/> Quality <input type="checkbox"/> Price <input type="checkbox"/> Taste <input type="checkbox"/> Animal welfare, e.g. free range <input type="checkbox"/> Buying organic food <input type="checkbox"/> Environmental impact	<input type="checkbox"/> Buying fair trade <input type="checkbox"/> Buying British <input type="checkbox"/> Trust in food safety <input type="checkbox"/> Buying food in season <input type="checkbox"/> Buying locally produced food <input type="checkbox"/> None of these
	Routine / Choice / Impulse		<input type="checkbox"/> Healthy eating <input type="checkbox"/> Quality <input type="checkbox"/> Price <input type="checkbox"/> Taste <input type="checkbox"/> Animal welfare, e.g. free range <input type="checkbox"/> Buying organic food <input type="checkbox"/> Environmental impact	<input type="checkbox"/> Buying fair trade <input type="checkbox"/> Buying British <input type="checkbox"/> Trust in food safety <input type="checkbox"/> Buying food in season <input type="checkbox"/> Buying locally produced food <input type="checkbox"/> None of these

Now please arrange your shopping in groups according to those types of things you bought for similar reasons (e.g. I always buy; trusted brands; on offer etc.) and take photographs of each group of items. Please send your photographs to Samantha.Rushforth@tns-bmrb.co.uk and state what group each represents or write down here:

Photo number	Items in it	Reason they are a group
1		
2		
3		

Photo number	Items in it	Reason they are a group
4		
5		
6		
7		

3. Day 1 Discussion Guide

Agenda item	Stimulus	Content
NB – Set up clarification questions flip chart in every room, ensure all participants have post its for clarification questions and you have flip charts with ‘Who’s involved in the ‘food system’ – Manufacturers, retailers, caterers, government’		
10:00-10:10	PLENARY – WELCOME AND INTRODUCTIONS	
Welcome and introductions (10 mins) PLENARY	NONE	<p>LEAD FACILITATOR TO WELCOME PARTICIPANTS AND INTRODUCE THE FORMAT OF THE DAY</p> <ul style="list-style-type: none"> • Introduce self and TNS BMRB – independent market research agency • The topic we will be talking about today is food • We will be asking you questions about your food choices and shopping habits • We will also be showing you some things you may or may not have heard about before • There will be quite a lot to take in but we will be doing it in a fun way – with presentations, table conversations and other activities • It is not a test and this is not school! We genuinely want to know where you don’t understand things and we want to hear your questions too • There will be regular breaks for refreshments throughout the day, help yourself to tea, coffee or water as you wish • LEAD MODERATOR TO TALK THROUGH INTRO SLIDES and Which? and GO science to Introduce themselves and purpose of the research • Introduce any other observers or video crew (if appropriate) We have a number of colleagues who will be observing the sessions (introduce them), they are working with us on the project and should just blend into the background • We are also recording the table discussions for our records and we’ll will be filming the day (Explain filming, where relevant) • You will each have a WORKBOOK on the table in front of you – this is for you to use and record your thoughts and feelings as you wish, you will also have some structured tasks to do but your table facilitator will tell you about them as and when they come up <p><i>HANDOVER TO BREAKOUT TO DISCUSS THEIR PRIORITIES WHEN MAKING FOOD CHOICES AND WHAT THEY KNOW ABOUT HOW FOOD IS PRODUCED</i></p>
10:10 – 10:35	BREAKOUT – PRE-TASK AND DISCUSSION OF SUSTAINABILITY	
Introductory discussion (25 mins) AT TABLES	<p>PRE-TASK</p> <p>FC – CONSUMER PRIORITIES</p> <p>FC – PRIORITIES FOR THE FOOD INDUSTRY</p>	<p><i>Explain – In this session we want to know more about your priorities when making food choices and what you think about people’s diets and the way food is produced. At the end of the session we will write up two lists of your priorities (when you’re making food choices) and what you think should be priorities for everyone involved in the food system (manufacturers, retailers, caterers, farmers) and the Government which we can refer to through the day to see if your views change at all.</i></p> <p><u>Facilitator introduction (10 mins)</u></p> <ul style="list-style-type: none"> • Introduce self, repeat that we are impartial market researchers • Get permission to record • Ensure all participants have their pre-task • Warmup/introductions – • In pairs, spend a few minutes discussing their priorities when making food choice, explain they will need to introduce their partner including first name and what they tend to think about when choosing what to eat • Go around the table one-by-one, each person introduces their partner and what is most important to them when choosing what they are going to eat <p>(FACILITATOR TO NOTE CONSUMER PRIORITIES ON FLIPCHART – Stick to wall, we will refer back to these)</p> <p><u>Spontaneous food sustainability awareness (15 mins)</u></p> <ul style="list-style-type: none"> • What do you know about what farming is like these days? • What do you know about what food production processes are like these days?

		<ul style="list-style-type: none"> • What are people’s diets like these days? • What issues are they aware of around the way we produce, buy and consume food these days? • What opportunities are there? How are we becoming better at producing food? • If you could decide what the priorities for food farmers and manufactures should be (over the next 10 years) what would these be? <p>(FACILITATOR TO WRITE UP ON FLIPCHART - PRIORITIES FOR THE FOOD WHERE FOOD COMES FROM – Prompt on RETAILERS, MANUFACTURES, FARMERS AND GOVERNMENT)</p> <p>HANDOVER TO PLENARY TO HEAR MORE ABOUT FOOD PRODUCTION AND THE CHALLENGES WE FACE</p>
10:35 – 11:25	PLENARY – FOOD PRODUCTION AND CHALLENGES	
Food production quiz 15 mins	WORKBOOKS	<p><i>Explain – during this session, we’re going to watch a couple of videos on how food is produced and some of the problems with our food system and the consequences if we continue to eat and produce food in the way we do now. This is so that you have a good understanding of the range of issues that affect the way our food is produced. We’ll then discuss which issues you are most concerned about and you think should be prioritised.</i></p> <p><i>But first, we’re going to do a fun quiz, just to find out how much you do or don’t know about the way food is produced today. Just fill out your answers in your workbooks. There will be a prize for the winner.</i></p> <p><u>QUIZ (15 mins):</u> Questions -</p> <ol style="list-style-type: none"> 1. Global crop yields more than doubled (115%) between 1967 and 2007. How much did the area of land used for agriculture increase by during that same period? (8%) 2. How many people does the government estimate suffer from food poisoning in the UK each year? (1mill) 3. How many litres of water does it take to make one slice of bread? (18l) 4. How much of our food do we import into the UK currently? (40%) 5. How much land in the UK is used for farming? (71%) 6. What percentage of UK chickens and turkeys are reared indoors in the UK? (95%) 7. What percentage of UK adult population is overweight or obese? (60%) 8. How much food is wasted or lost globally? (30%) 9. Producing a steak releases the same amount of carbon dioxide as driving a car how far? (6 mile) 10. What proportion of the UK’s greenhouse gas emissions are from agriculture? (14%) <p>Lead facilitator to take participants through correct answers.</p> <p>Ask participants to put up their hands if they got more than X number right, working up from 5, until get a winner</p> <p>Ask as a group what surprised them and what this tells them about the way our food is produced or the kinds of choices people are making</p>
Introduction to modern food production processes 20 mins	CLARIFICATION QS FLIP CHART AND POST ITS	<p>Lead facilitator to introduce video – we’re now going to see a short video that should explain a bit more about how food is currently produced for people in the UK.</p> <ul style="list-style-type: none"> • HAND OUT BIOGRAPHIES AND EXPLAIN – <i>During these workshops, you are going to see comments from a range of people who are involved in food, including farming, government and charities. These people have been selected to give you an idea of the range of opinions out there on this subject and we have asked our Advisory Group and Government Management Group to comment on them to ensure they are not biased. Whilst these people are well respected and knowledgeable in this area, we are not presenting these opinions as fact or asking you to decide between these. We are showing you these videos to give you a sense of the range of things people are talking about in relation to food sustainability so you can bear this in mind when feeding back your final comments on what should be prioritised going forward.</i>

		<p>Show FOOD PRODUCTION PROCESSES TODAY VIDEO (15 mins)</p> <p>Lead facilitator instruct participants to record their private responses in their workbook and make a note of any questions on post its</p> <ul style="list-style-type: none"> • Then, facilitator ask: <ul style="list-style-type: none"> ○ Spontaneous responses and questions ○ What did you hear/what stood out to you about this presentation? ○ What is new/have you not heard before ○ How does this change your view of food production in the UK? ○ What, if any, concerns do you feel at this point? <p>LEAD FACILITATOR TO NOTE RESPONSE ON FLIP CHART – SECOND FACILITATOR TO NOTE CLARIFICATION QUESTIONS – ASSURE THEM THAT WHICH? AND GO SCIENCE WILL TAKE THESE AWAY AND LOOK INTO THEM</p> <p>EXPLAIN – IF THEY THINK OF OTHER QUESTIONS THROUGHOUT THE DAY THEY CAN MAKE A NOTE OF THESE ON POST-ITS TO STICK TO BOARD OR ON THE BOARD THEMSELVES. THERE ARE BOARDS IN HERE AND IN THE OTHER ROOM</p>
Introduction of idea of food supply challenges PLENARY (15 mins)	TIM BENTON VIDEO	<ul style="list-style-type: none"> • Lead facilitator to introduce video – we are experiencing ‘a perfect storm’ developing in terms of challenges for our food production and supply. Tim Benton has made a video for us; he is the Champion for the UK’s Global Food Security Programme – which looks to ensure that strategically important research is carried out on food security. He’s also a leading researcher on finding more sustainable ways to farm for food. He’s based at the University of Leeds (Ref to Bio) <p>Show TIM BENTON OVERVIEW OF FOOD SYSTEM CHALLENGES VIDEO – presenting the big issues in relation to the environment, food supply and public health in a general presentation</p> <ul style="list-style-type: none"> • Lead facilitator hands back to table facilitators for discussion/response to video <p>HANDOVER TO BREAKOUT TO DISCUSS THESE CHALLENGES AND HOW IMPORTANT YOU THINK THESE ARE</p>
11:25 – 11:50	BREAKOUT – REACTION TO CHALLENGES	
Reaction to food supply challenges AT TABLES (25 mins)	HANDOUT ON FOOD SUPPLY CHALLENGE WORKBOOK	<p><i>Explain – during this discussion, we are going to discuss the challenges that Tim Benton raised in his video. We want to know how much of a problem you think these challenges are and what effect you think they will have on you. We also want you to think about how important these issues are to you and whether you are likely to change what you eat as a result. Which? and the Government Office for Science can feed this back to Government and the Food Industry when they are making decisions about what food system challenges they should focus on.</i></p> <p><u>Response to video (10 mins)</u> Facilitator asks participants to record private responses/questions in WORKBOOKS then asks:</p> <ul style="list-style-type: none"> • What did they hear? • Explore concerns/scepticism etc. • Which of the challenges were they already aware of? Which were new to them? <p>MODERATOR RECORD ON FLIPCHART ANY CLARIFICATION QUESTIONS THEY HAVE – ASSURE THEM THAT THESE WILL BE FED BACK TO EXPERT LATER</p> <p><u>Detailed discussion of the issues and challenges outlined in Tim Benton’s presentation (25 mins)</u></p> <ul style="list-style-type: none"> • Introduce HANDOUT here – THIS HANDOUT WILL SET OUT THE CHALLENGES OUTLINED BY TIM BENTON WITH A SEPARATE ISSUE ON EACH SLIDE. • FACILITATOR TO PROBE ON EACH ISSUE AT A TIME AND INSTRUCT PARTICIPANTS TO REVIEW MATERIALS TO JOG THEIR MEMORY – <u>DO NOT READ THROUGH:</u>

		<ul style="list-style-type: none"> • For each use probes below to help participants think about how these challenges play out in real world situations <ul style="list-style-type: none"> ○ Food Security <ul style="list-style-type: none"> ▪ Tim talked about how extreme weather can effect food supply ▪ What have they heard / seen on the news about food shortages ▪ Do they ever remember not being able to buy certain things or food going up in price ○ Obesity and diet related illness <ul style="list-style-type: none"> ▪ How surprising are the proportion of people who are overweight ▪ Why is this the case ▪ How easy or difficult is it to make healthier food choices ○ Food prices / affordability <ul style="list-style-type: none"> ▪ What do people think about this idea that food prices are too low or that deals are encouraging people to under value food ▪ Refer to priorities – you said that price is important to you – how does hearing this make you feel about having price as a major consideration ○ Climate Change <ul style="list-style-type: none"> ▪ How much do you think about the impact of growing your food and rearing animals – not just transporting it (Food miles is a small part of the overall emissions) ▪ What if cutting down emission meant that you couldn't get everything you wanted all year round or you had to pay more – how important is choice versus the impact that this has on our environment ○ Water Use <ul style="list-style-type: none"> ▪ What have you heard on the news / media about the water that is used to produce food ▪ How much do you care that the food you buy is using water from reserves in other countries that can't be replaced ▪ What if this led to shortages which meant that prices went up (i.e. because Egypt cannot grow certain crops anymore and this means supply goes down but demand stays the same?) ○ Regulation – Ensure you leave time to cover this <ul style="list-style-type: none"> ▪ What have you heard about regulation in the past ▪ Does this align with what you expected • Following discussion probe on: <ul style="list-style-type: none"> ○ How do they think hearing about this issue might affect their food choices when they are deciding what to eat? ○ Explore views about how the choices people make shape the way food is produced <p><i>HANDOVER TO BREAK AND EXPLAIN TO PLENARY AFTERWARDS</i></p>
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BREAK – 11:50-12:05

12:05-12:20	PLENARY – FOOD PRODUCTION AND CHALLENGES	
Range of perspectives on food sustainability challenges (PLENARY) 15 mins	TALKING HEADS VIDEO	<p>LEAD FACILITATOR INTRODUCE TALKING HEADS VIDEO (10 MINS)</p> <p><i>EXPLAIN, You are going to see a range of perspectives on the challenges Tim Benton has outlined, this is to give you an understanding of the range of issues and concerns people are talking about in relation to food, for you to think about when deciding where Government and the food Industry should focus their attention.</i></p> <p><i>Remind participants that the people taking part in the video have been carefully selected to show a range of perspectives and that they can read more about the contributors in their Biographies document.</i></p> <p>Show RESPONSE TO FOOD SYSTEM CHALLENGES VIDEO</p>

		HANDOVER TO BREAKOUT FOR DISCUSSION/RESPONSE TO VIDEO
12:20-12:50	BREAKOUT – CHALLENGES	
Response to perspectives on food sustainability challenges (AT TABLES) 25 mins	<p>WORKBOOK</p> <p>CHALLENGES CARDS</p> <p>POST-ITS</p>	<p><i>EXPLAIN – In this session you are going to revisit those CONSUMER priorities and priorities for WHERE FOOD COMES FROM you came up with in the first group discussion, to decide, based on what you’ve heard so far, which challenges you think should be prioritised by food industry and government going forward.</i></p> <p><u>Initial response (5 mins)</u></p> <ul style="list-style-type: none"> • Facilitator asks participants to record private responses/questions in WORKBOOKS then asks: <ul style="list-style-type: none"> ○ What have you heard/understood? ○ Which points really stood out to you? ○ What questions do you have? <p>NOTE ANY CLARIFICATION QUESTIONS ON FLIPCHART</p> <p><u>SUSTAINABILITY CHALLENGES EXERCISE (20 mins)</u></p> <p><i>Explain, in the videos, you have heard people talking about the issues they think need to be addressed in our food system. We want you guys to think about which of the challenges we have discussed you think you are most worried about and how they compare to the others</i></p> <p><i>In mini groups, ask participants to sort cards based on which challenges are most pressing to them. They can add challenges on post its. Tell them to refer back to flip charts from earlier in the day – which would and wouldn’t you compromise on in order to address these challenges.</i></p> <p><i>As a group, compare ranking and decide on top three – four challenges and discuss what they want to see done about these. Moderator to note on flipchart.</i></p> <p>NOTE to researcher – you want them to get to 3 or 4 challenges and what they want to see done about these and by who (e.g. water use – government should make people aware of how much water goes into the food we eat so we waste less; climate change – food manufacturers should look at being more)</p> <ul style="list-style-type: none"> • Which challenges do they feel are the most important priorities that need to be addressed? • Whose responsibility do they think it is to address these challenges and what should they be doing about it? (NOTE ON FLIPCHART – against each type) • Probe for <ul style="list-style-type: none"> ○ Government ○ Farmers ○ Food Manufacturers ○ Food retailers ○ Consumers <p>HANDOVER TO PLENARY</p>
12:50-13:05	PLENARY – FOOD PRODUCTION AND CHALLENGES	
Feedback session PLENARY (15 mins)	NONE	<ul style="list-style-type: none"> • Each table feedback their top 3 priorities for ensuring food sustainability in the UK and what they want to see done about these • FACILITATOR TO TAKE FLIPCHARTS BACK TO BREAKOUT FOR NEXT SESSION <p>HANDOVER TO LUNCH AND BRIEFLY EXPLAIN CASE STUDIES</p>
LUNCH BREAK (40 MINS) 13:05-13:45		
13:50-15:30	BREAKOUT – CASE STUDIES 1 AND 2	
Case studies – 45 minutes per case study	CASE STUDY HAND OUT	<i>Explain, we are now going to see how the issues we discussed earlier play out in relation to everyday foods – we want to know what stands out to you the most, what you feel less comfortable with and what questions you have.</i>

<p>Case study 1 13:50 – 14:35</p> <p>Case study 2 14:35 – 15:20</p>	<p>PRE TASK WORKBOOK</p> <p>NB – mix up pairings for each case study</p>	<p>FOR EACH CASE STUDY FOLLOW THIS SEQUENCE (50 MINS PER CASE STUDY):</p> <p><u>Introduction to case study (5 mins)</u> We will be discussing wheat/beef/chicken (DELETE AS APPROPRIATE) Probe on:</p> <ul style="list-style-type: none"> ○ How often they eat foods containing this product? ○ What meals have they had in the last week that included foods made from wheat/chicken/beef? ○ What did they think about when choosing food made from wheat/chicken/beef? ○ What were their priorities? <p><u>Case study presentation (10 mins)</u></p> <ul style="list-style-type: none"> • Facilitator to provide WHEAT/BEEF/CHICKEN HANDOUT explain that Which /GO Science will talk them through the information. They are not experts but they will answer questions where they can or we'll make a note of questions you have and try to find the answers before the next session. <p><u>Discussion of case Study (30 minutes)</u> Once Which? GO Science have gone through the materials, facilitator instruct participants to complete WORKBOOKS to document individual responses.</p> <ul style="list-style-type: none"> ○ Anything they didn't understand or questions for next time (RECORD ON CLARIFICATION QUESTIONS FLIPCHART) <p><i>In pairs, make a note of the three things that stood out to you and what questions you have about how this food is produced. Once complete ask participants to group these on the table (what stood out on one side and questions on the other – first pair places their post it notes – then invite others to add theirs, grouping them with other similar post its) RESEARCHER – ENSURE YOU KEEP THESE IN PILES FOR ANALYSIS PURPOSES</i></p> <p><i>Once all post its are arranged – facilitator to go through each group and probe on:</i></p> <ul style="list-style-type: none"> ○ How does this make you feel about this food? ○ Whether this made them feel particularly uncomfortable and why? ○ How would this affect your food choices? In what way? ○ What more do you need to know? ○ Does this change your views about the priority challenges and actions discussed earlier? <ul style="list-style-type: none"> • At the end of the each case study, each group prepares their top 3 thoughts and top 3 questions about each case study
<p>15:20-15:30 COFFEE BREAK (10 mins)</p>		
<p>15:30-16:15</p>	<p>BREAK OUT – FINAL CASE STUDY</p> <p><i>HANDOVER TO NEXT SESSION</i></p>	
<p>16:15-17:00</p>	<p>PLENARY – FEEDBACK AND SOLUTIONS VIDEO</p>	
<p>Feedback on case studies PLENARY (25 mins)</p>	<p>FLIPCHARTS from previous session</p>	<p><i>Explain, in this final session, we want to hear from you on what you thought about the issues we discussed in relation to each of the case studies. We're then going to watch a video on some of the solutions that could be applied to tackle these issues. We'll discuss these more next week.</i></p> <ul style="list-style-type: none"> • A pair from each table reports back their top 3 thoughts and top 3 questions for each of the case studies
<p>Summary of possible solutions PLENARY (15 mins)</p>	<p>VIDEO – TIM BENTON</p>	<p>LEAD FACILITATOR TO INTRODUCE OVERVIEW OF SOLUTIONS:</p> <ul style="list-style-type: none"> • We've explained all about the challenges that the UK faces at the moment and the need to create a sustainable future. We are going to focus in on the solutions next week but do an overview now. • I'm now going to show you a video explaining some of the ways we can address food sustainability issues

		<p>Show TIM BENTON SOLUTIONS VIDEO (10 mins)</p> <ul style="list-style-type: none"> • Participants complete self-completion task in WORKBOOK • NOTE ANY CLARIFICATION QUESTIONS and probe on: <ul style="list-style-type: none"> ○ What have they heard? ○ Pros, cons and no-go areas ○ How they feel about the issue in the light of the solutions they have heard about
Thank and close (5 mins)		<p>Facilitator thanks participants for their contributions and reminds them about homework task before next week's session</p> <p>Opportunity for Which?/GO Science to respond to any points made in the sessions</p>

4. Day 1 Participants workbook



Participant workbook

Name:

Which? And Government Office
for Science research into food

Location:

DAY 1

Date:

QUIZ

TICK YOUR ANSWER BELOW

1. Global crop yields more than doubled between 1967 and 2007. How much did the area of land used for agriculture increase by during that same period?
A) 8% B) 28% C) 88%
2. How many people does the government estimate suffer from food poisoning in the UK each year?
A) 200,000 B) 1 mill C) 5 mill
3. How many litres of water does it take to make one slice of bread?
A) 1 B) 8 C) 18
4. How much of our food do we import into the UK currently?
A) 20% B) 40% C) 70%
5. How much land in the UK is used for farming?
A) 37% B) 58% C) 71%
6. What percentage of UK chickens and turkeys are reared indoors in the UK?
A) 40% B) 75% C) 95%
7. What percentage of UK adult population is overweight or obese?
A) 50% B) 60% C) 70%
8. How much food is wasted or lost globally?
A) 15% B) 30% C) 50%
9. Producing a steak releases the same amount of carbon dioxide as driving a car how far?
A) 500 feet B) 1 mile C) 6 miles
10. What proportion of the UK's greenhouse gas emissions are from agriculture?
A) 4% B) 14% C) 24%

VIDEO 1 – FOOD PRODUCTION

WHAT ARE MY FIRST THOUGHTS AND IDEAS ABOUT THIS PRESENTATION?

WHAT STANDS OUT TO ME?
WHAT DO I REMEMBER?

WHAT DO I REALLY LIKE OR DISLIKE ABOUT WHAT I'VE HEARD?

WHAT QUESTIONS DO I HAVE?

5. Day 1 Introduction to workshop presentation

Public Dialogue on Food System Challenges

Week 1

Welcome!



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Why we are doing these events

We've been asked by Which? and Government Office for Science to do this research, they want to know:

- What you know about the diets people eat and where our food comes from?
- What are your priorities when it comes to food i.e. what do you think about most when deciding what to eat and what worries you?
- How you feel about the challenges in the current food system? (i.e. the problems we may face if we continue to produce and consume food in the way we do now)
- Whether you think something needs to be done and if so what are the most important issues to address?
- What you think about different potential solutions and what solutions (if any) you think should be prioritised and why?



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How Which? and Government Office for Science will use this information

All of this insight will be **made into a report** which will be shared with **government** and **policy makers** to ensure that consumers' views are heard when **decisions about the future of the food system** are being made.

Government Office for Science will feed this back to various **Government departments** who will use this information when making decisions about food technology and how food is produced in the future.

Which? will use this information to **ensure consumers' interests are taken into account by Government, food retailers, caterers, food manufactures and farmers.**

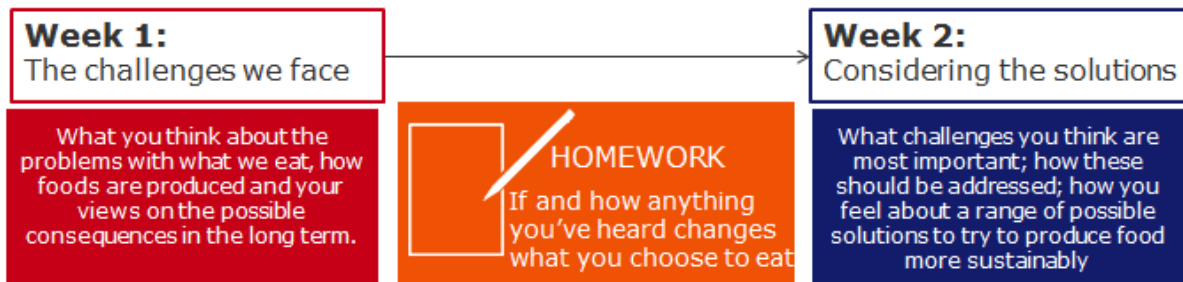
At the end of week 2, we will ask you to come up with an **'action plan'** – that is a list of **recommendations of what you want government, retailers, caterers, food manufactures and farmers to do.** Government Office for Science and Which? will then use these findings when feeding back **what you as citizens' want.**



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A reminder - How the events will work

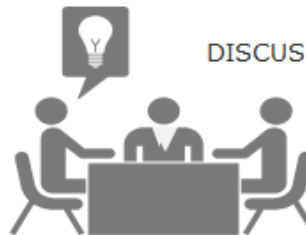


Throughout both days....



EXPERT VIDEOS

Input from recognised experts from a variety of relevant organisations. To give a range of perspectives on the issues at hand.



DISCUSSION AND EXERCISES

A chance for you to discuss, reflect and feedback – Interactive and fun!

Leading up to an Action Plan – what should be done about these challenges?



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Introducing Which? and Government Office for Science



- Who we are
- Why we commissioned this research
- How we will use the findings
- Role of the Advisory Group, who was on the advisory group, what they are interested and how they've helped us develop the research



Government Office for Science

- Who we are
- Why we commissioned this research
- How we will use the findings
- Role of the Government Management Group, who was on the Government Management group, what they are interested and how they've helped us develop the research



Role of the experts, what are their credentials and how they were selected.



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5

Week 1 Agenda

PLENARY	Welcome and Introductions	10:00-10:10
BREAKOUT	Discussion of Food Priorities	10:10-10:35
PLENARY	Food system challenges	10:35-11:25
BREAKOUT	Response to food system challenges	11:25-12:00
	BREAK	12:00-12:15
PLENARY	Other perspectives on food system challenges	12:15-12:30
BREAKOUT	Priorities for the food system	12:30-12:55
PLENARY	Feeding back priorities	12:55-13:05
	LUNCH	13:05-13:45
BREAKOUT	Case studies 1 and 2	13:45-15:20
	BREAK	15:20-15:30
BREAKOUT	Case study 3	15:30-16:15
PLENARY	Feedback and thinking about solutions	16:15-17:00

6. Presentation - Overview of food systems challenges (accompanying Tim Benton video)

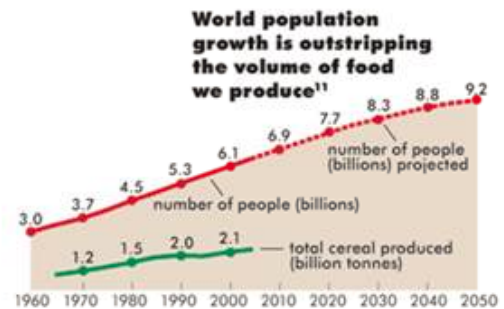


Prof. Tim Benton, UK Champion for Global Food Security, talking about the challenges within our food system

Food security and potential shortages

By 2050, the world may demand 60-100% more food (up to double what we produce now)

The UK may not always be able to guarantee supply of imported foods, particular if there are extreme weather events in other parts of the world.



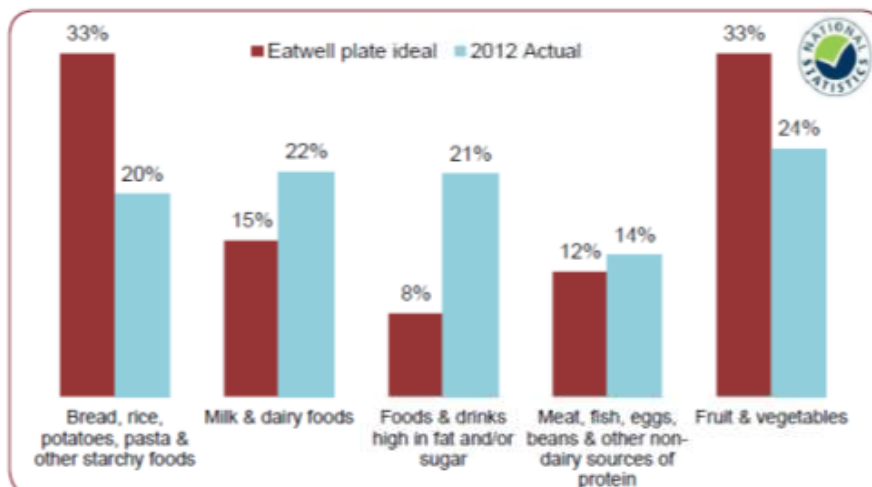
It is estimated that there will be a third more people on the planet in the next 30 years

- In 2008 food price rises caused riots in many countries
- Prices are predicted to rise again in the next 10 years

Obesity and diet related disease

60% of the UK adult population and 30% of children are overweight or obese. Very few people eat a balanced diet as recommended

We're eating too much dairy and foods that are high in sugar and fat and not enough fruit and veg and starchy foods.



Source: Family Food 2012, Defra, December 2013.

Food prices / affordability

Food is not affordable for all: 1 million people accessed food banks last year...



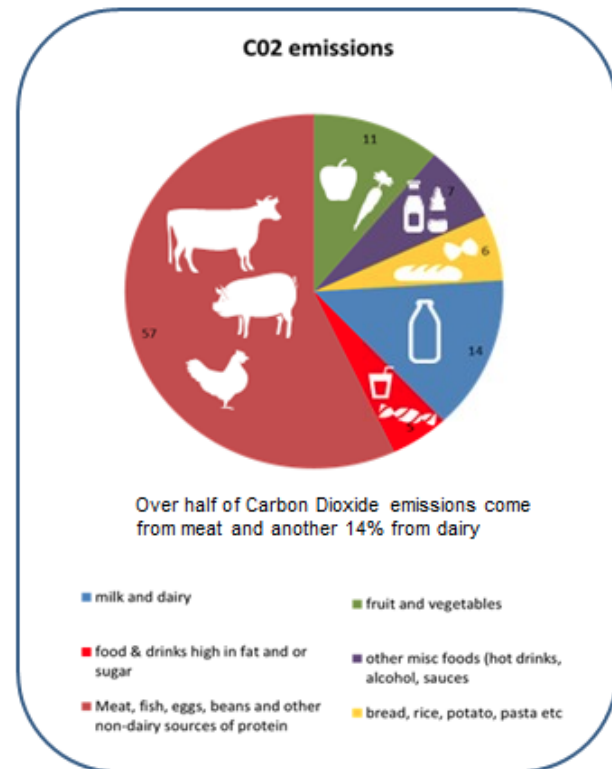
...but are low cost foods and promotions encouraging others to waste food?

Climate Change

By 2050, agriculture will account for 2 degrees of global warming due to Greenhouse Gas emissions.

Greenhouse Gases include Carbon Dioxide and Nitrous Oxide. Scientists believe that Greenhouse Gases cause global warming and affect weather.

Transport, including air freight, does contribute GHGs, but is seen to play a lesser role compared to other ways that GHGs are produced throughout the whole production lifestyle.



Water use

- In some places rates of water extraction (for use in food production) are exceeding the rate of replacing that water.
- 70% of total global water withdrawals from rivers and the ground is used for food production.
- Demand for water for agriculture could rise by over 30% by 2030. Total global water demand could rise by 35–60% between 2000 and 2025.
- In some arid* regions of the world, several areas where ground water is being withdrawn for food are now running out and can't be replenished, for example in the Punjab, Egypt, Libya and Australia. There is the risk of wealthy countries exploiting water reserves in low-income countries.



A family's food for 8 months requires an Olympic size swimming pool of water to produce

*A region is arid when there is a severe lack of available water, to the extent of hindering or preventing the growth and development of plant and animal life. Environments with arid climates tend to lack vegetation.

An overview of how food technologies are currently regulated

General approach

The level of regulation of different food technologies will depend on what stage they are in development. Legislation has often been updated as new technologies are developed.

There is a general requirement that all foods should be safe under our Food Safety Act (which is in line with the EU general food law regulation), but more specific rules can apply when dealing with new types of foods or processes – as well as for things like food additives, pesticides and packaging materials.

In general, foods that are considered new or novel (for example, haven't been on the market for sale before) are covered by an EU regulation on novel foods. This requires that certain foods and processes have to be assessed as safe and then approved before they can be sold.

This regulation is currently under review to try and make sure it includes all relevant types of food and technology. It is also proposed that scientific safety assessments will be done centrally through the European Food Safety Authority. Currently they are done in the EU country where the relevant food is first going to go on the market. It would still be up to individual EU Member States to decide whether or not a product should be approved, taking into account the safety assessment and any other relevant issues. There can be different views about how much weight is given to the scientific assessment and other factors, such as ethical or economic issues for example.

Cloning of animals is being looked at as part of this review. It is likely that there will be a separate proposal. Discussions within the European Parliament and between EU member states are focusing on how far controls should go – for example whether approval and labelling is needed for the offspring of clones (eg. from a clone bred with a conventional animal) or just clones.

Specific regulations

Some types of technology have more specific regulation. There are, for example, specific rules on GM food and animal feed, both for whether GM crops can be grown and whether they can be used in food or feed. There has to be an assessment for their safety and environmental impact. This is done by the European Food Safety Authority. Member States then decide whether to give approval for their use. Because Member States have had different views about whether GM crops should be grown, a law has recently been passed that will mean that the scientific assessment will still be done EU-wide, but that individual member states will be able to decide whether or not they should be grown in their countries and, if so, what controls need to be in place.

Labelling

Specific labelling rules also apply for certain technologies. Irradiated foods for example have to be labelled. GM foods have to be labelled where they contain more than 0.9% Gm material. The debate is still on-going about whether the products of clones and their offspring would need to be labelled.

7. Day 1 Beef Case Study

CASE STUDY:

Meat Production and Consumption - the type of things you've been buying



From Field...



... To Fork



Different ways we farm cows worldwide



Landless production (indoors)

- 5% of beef
- Cattle reared entirely indoors and fed a mix of hay or silage* and grains

- ISSUES INCLUDE
- Diseases spread easily
 - Grains grown for feed to replace grazing/pasture
 - Water use, Greenhouse Gases

Benefit - Low cost meat

*a form of conserved grass that is preserved using a natural pickling process

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Intensive grazing systems

- 24% of beef production
- Cattle eat all the grass or 'forage' in one paddock or area of land and are then moved to another

- ISSUES INCLUDE
- Competition with food crops for fertile land
 - Overstocking
 - Soil degradation due to trampling
 - Greenhouse Gases

Benefit - Low cost meat



Mixed grazing systems

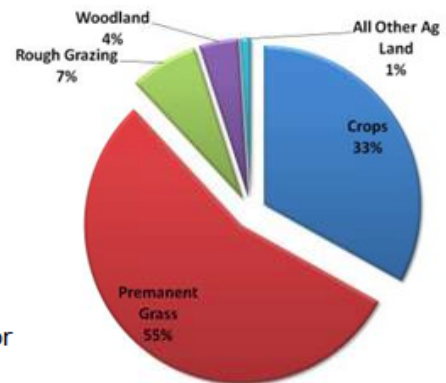
- 83% of milk
- 71% of beef
- Cattle and other livestock have access to large areas of land to feed on

- ISSUES INCLUDE
- Water use
 - Manure can enter streams and other surface water sources, which damages wildlife and presents human health hazard

Benefit - Some land only suitable for cattle e.g. uplands

Growing animals for food

- Red meat - like beef - is a good source of protein and other nutrients, e.g. iron
- Whilst red meat can form part of a healthy diet, eating too much probably increases risk of bowel cancer. So the Department of Health recommends that people who eat 90 grams a day cut down to around 70 grams. Ninety grams is the equivalent of about three thin-cut slices of roast beef, lamb or pork, where each slice is the about the size of a pack of playing cards. (2)
- Animal products (e.g. meat, eggs, dairy) account for nearly half (40%) of the value of produce sold by farmers globally A quarter of the Earth's land surface (that's not covered by ice) is used for grazing (1)



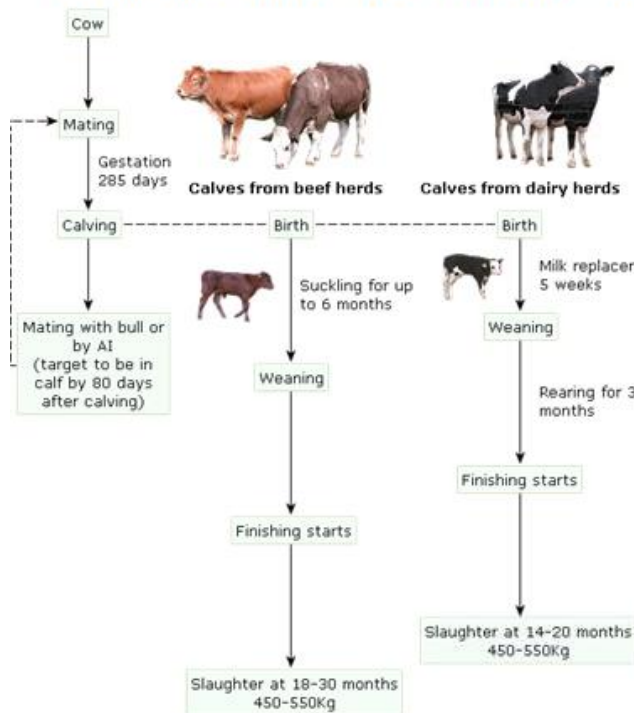
This pie chart shows that 63% of UK agricultural land is used for grazing animals for food (permanent grass and rough grazing) (3)

33% is used for crops (some of which will also be fed to animals)

- 1) Report for the Food and Agriculture Organization of the United Nations: <http://www.europarl.europa.eu/climatechange/doc/FAO%20report%20executive%20summary.pdf>
- 2) NHS <http://www.nhs.uk/Livewell/Goodfood/Pages/red-meat.aspx>
- 3) Report for Department for Environment, Food and Rural Affairs: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/208436/auk-2012-25jun13.pdf

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How we rear beef cattle in the UK



It is now common to have separate beef and dairy herds as specialised cattle have been bred to give either good meat or good milk.

Cattle are slaughtered for meat at around 2 years old.

Calves from beef herds will be suckled for up to 7 months and then given feeds that get them ready for slaughter. This is called finishing.

Calves born to dairy cows will be sold to a beef farmer after 1 week. They are usually kept in individual pens and fed milk replacer and concentrated feed. Finishing starts earlier and they tend to be slaughtered earlier. (4)

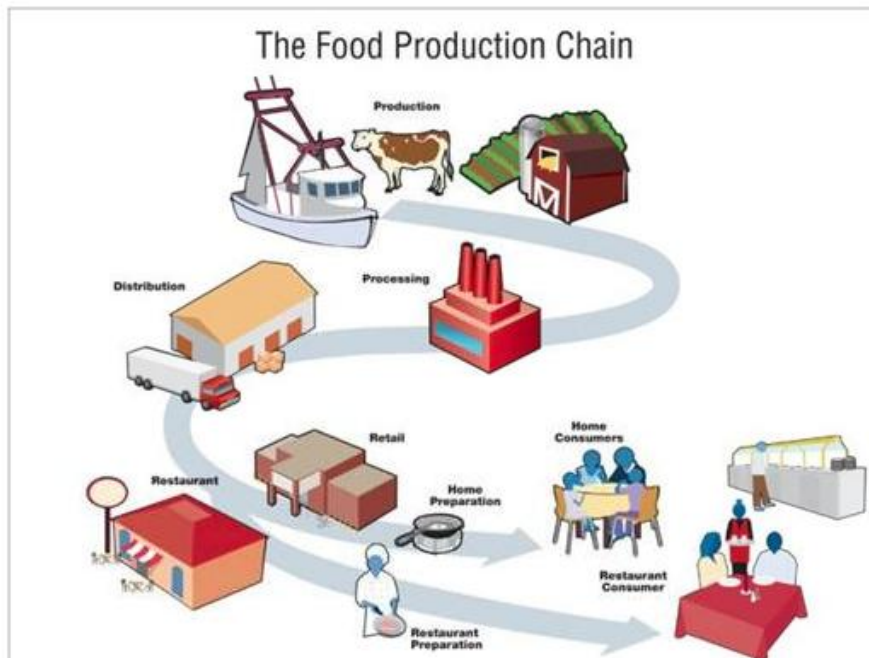
Cattle spend the winter indoors, which stops them from churning up the grass in their fields and they don't get foot rot. It is also easier for farmers to feed, water and check for health issues (5)



Dairy cattle raised for beef

4 <http://www.ukagriculture.com/>
 5 <http://www.agriculture-4-u.co.uk/pages/Livestock/beef/beefprod.php>

How beef gets to our plates



6) Source: Centres for Disease Control and Prevention
<http://www.cdc.gov/foodsafety/outbreaks/investigating-outbreaks/production-chain.html>.

8. Day 1 Chicken Case Study

CASE STUDY:

Chicken Production and Consumption - the type of things you've been buying



From Field...



Farming
and
processing



... To Fork



Issues we will be considering...



Rearing practices
and welfare



Supply



Efficiency

Two separate industries



Farms mainly raise broiler chickens that are bred and reared for meat: UK farms have capacity for 116 million at any one time and slaughter 750 million annually (1)



Laying hens are bred and reared for eggs: UK farms have capacity for approximately 29 million laying hens in the UK (1)

This case study looks at broiler chicken farming for meat specifically

1) Department for the Environment Food and Rural Affairs:

<http://archive.defra.gov.uk/foodfarm/farmanimal/diseases/vetsurveillance/species/birds.htm>

Different ways we farm chickens for meat



Intensive (indoor) rearing (1)

- Max 17-18 birds per square metre (UK)
- Reared inside only
- Slaughter at 33-38 days (UK)
- 94% of chicken in UK



Free-range (1)

- Max 12-13 birds per square metre (UK)
- Access to outside for at least 1/2 their life (UK)
- Outdoor space 1 square metre per bird (UK)
- Slaughtered at a minimum of 56 days (UK)
- 5% of chicken in UK



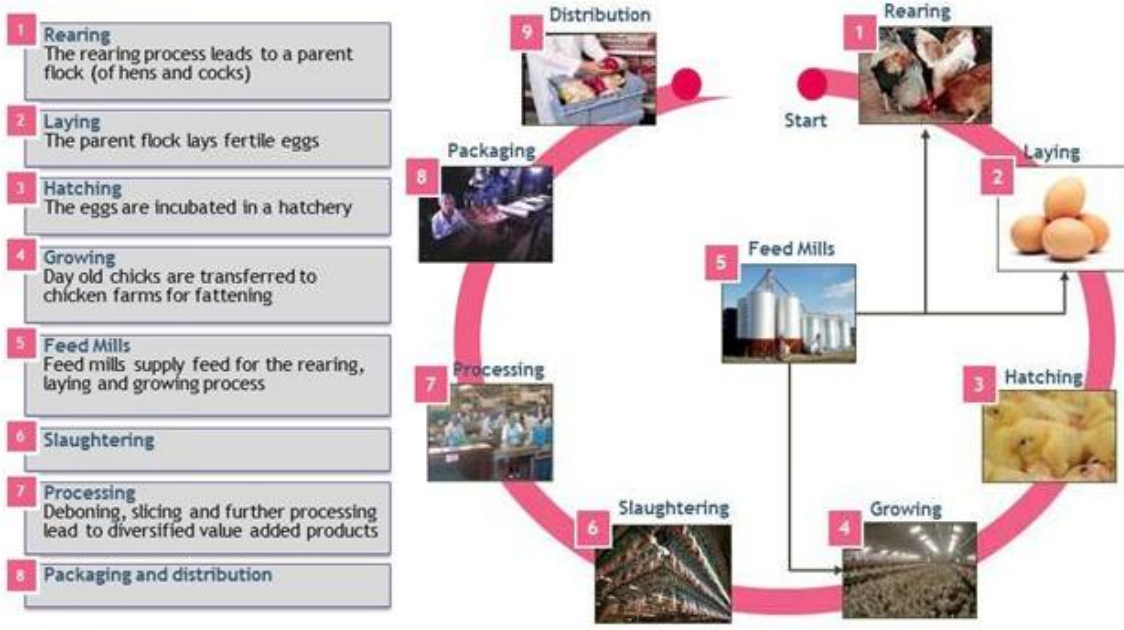
Organic (1)

- Approximately 10 birds per square metre (UK)
- Access to outside for at least 1/3 of their life (UK)
- Outdoor space 4 square metres per bird (UK)
- Continuous easy daytime access to suitable vegetation outdoors (UK)
- Slaughtered at a minimum of 81 days (UK)
- 1% of chicken in UK

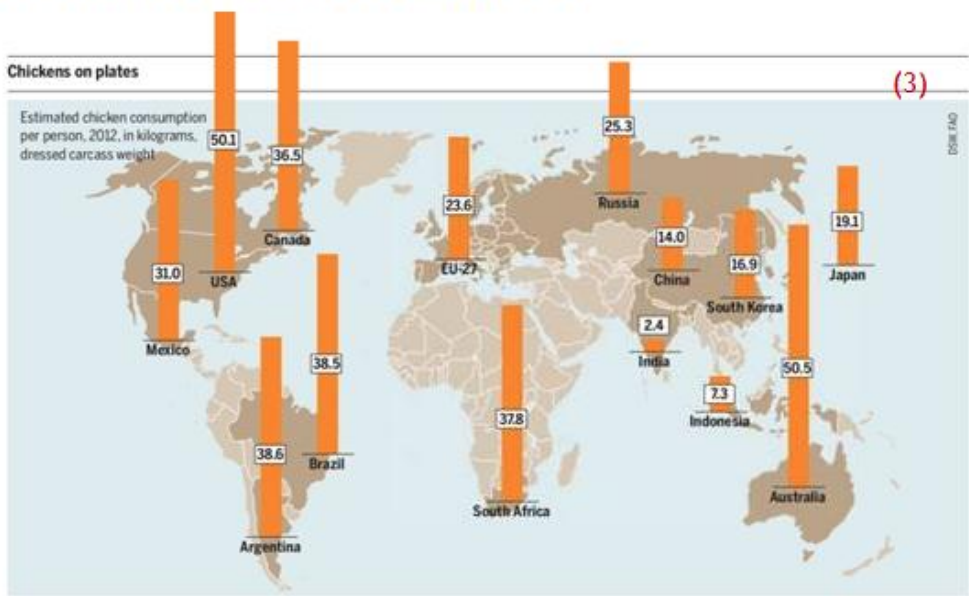
- **Benefits** = cost, efficiency
- **Issues** = disease, water use, growing enough feed, questions about taste and quality, slurry disposal, animal welfare
- **Benefits** = animal welfare, meat quality
- **Issues** = land use, cost, water use, growing enough feed
- **Benefits** = animal welfare, taste and quality, less use of antibiotics
- **Issues** = land use, cost, water use, efficiency

1) Source - British Poultry Council

How chicken gets to our plates



Global chicken consumption



We currently produce about 50 billion chickens per year worldwide. If China and India catch up with US consumption as predicted, we would need to double the amount of intensively reared chicken to 100 billion per year.

3) Report for Friends of the Earth: https://www.foeeurope.org/sites/default/files/publications/foee_hbf_meatatlas_jan2014.pdf

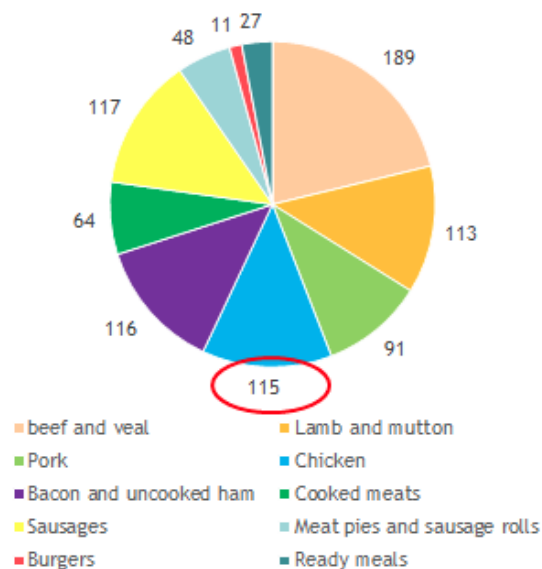
In the UK we are eating more poultry and less red meat

The average UK consumer eats around 890 grams of meat a week - that's a little over 46 kg per year ⁽⁵⁾

We're eating about 115 grams of chicken (about 1 small-medium chicken fillet) per week.

In the UK our meat consumption is reducing, it has fallen by 13% since 2007 - but we are eating more poultry and less red meat

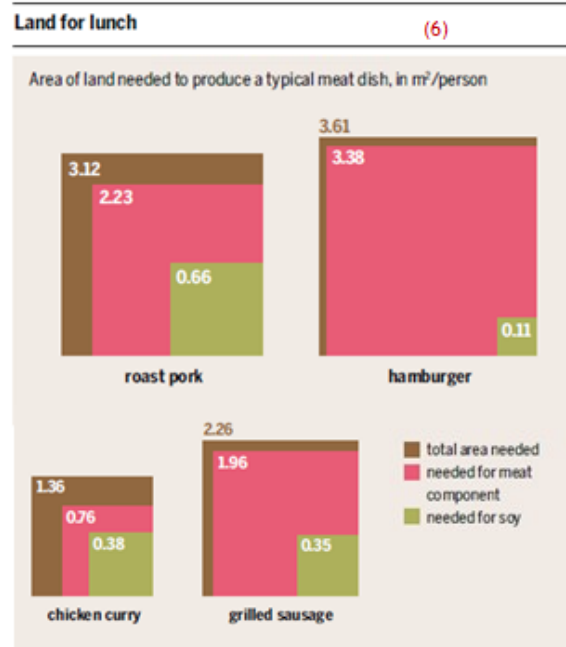
Amount consumed (average grams per person per week)



5) Family Food, 2013. p10. Data comes from the Family Food Module of the Living Costs and Food Survey (LCFS)

Switching to chicken may be beneficial as it is one of the most efficient meats

- We say that chicken is more 'efficient' because we eat a larger proportion of the meat on the animal compared to other meats
- Chickens also use less land than other meats - although still uses water and contributes to pollution via fertilisation of crops grown for feed (soy in the diagram)



6) Report for Friends of the Earth https://www.foeurope.org/sites/default/files/publications/foee_hbf_meatatlas_ian2014.pdf

SOME ISSUES TO CONSIDER:

- Environmental impact
- Growing Feed
- Intensive rearing
- Food safety

Environmental impact of chicken

Although chicken is an efficient source of meat, it still has an impact on the environment.

- Intensive rearing in chicken sheds require a lot of energy to heat and light. However, some do argue that intensively reared chicken is the most efficient type of meat. This is because they are grown in ideal conditions (e.g. the right temperature and the right type of food) and therefore don't need as much food or water (10)
- Water usage:
 - Chicken production uses almost 3 times the amount of water on a per kilo basis as the production of cereals (7)
- Wastewater from slaughterhouses can also be harmful to the environment*:
 - Wastewater has a high concentration of blood, fat, flesh and excrement, as well disinfectants like chlorine, which is harmful to the environment - particularly marine life
 - Germs like salmonella and campylobacter are often present and can be spread through water. (9) Campylobacter is one of the main causes of food poisoning in the UK
 - Excessive plant life can be stimulated through the levels of phosphorous and nitrogen present in the water (8)
- Chicken farms have to have environmental permits to operate. To get one they must have certain facilities and procedures to minimise environmental damage

* Slaughterhouses should comply with strict hygiene standards, which require a lot of water for cleaning down machinery and work areas. This water then carries both animal waste (blood etc.) and chemicals used for cleaning.

7) Waterfootprint.org: <http://www.waterfootprint.org/?page=files/Animal-products>

8) Water Research Center: <http://www.water-research.net/index.php/phosphates>

9) Maheshwari S (2013) Environmental Impacts of Poultry Production. Poultry, Fisheries and Wildlife Sciences 1 (101)

10) BeyondMeat: <http://beyondmeat.com/is-meat-production-an-efficient-use-of-resources/>

Environmental impact of growing feed for chicken



- It is not just the way we rear chickens that can harm the environment, the way we grow food for them can also be harmful
- Chickens in the UK are largely fed a mix of Soybean and grain. Soybean usually makes up about one-quarter of their feed (11)
- Intensive farming of soybean crops for feed has been blamed for the destruction of rainforest in South America
- When we grow food to give to animals, we don't get the same amount of calories back than if we ate the food ourselves (e.g. 1700 calories of wheat produces 500 calories of meat). Therefore if we started to grow food for humans on land that is currently used to grow food for animals then we could feed more people with the same amount of land. But, everyone would have to start eating less meat.

11) Environmental Audit Select Committee:

<http://www.publications.parliament.uk/pa/cm201011/cmselect/cmenvaud/writev/food/sf37.htm>

Intensive rearing

The vast majority (94%) of chickens we eat are intensively reared (in sheds). This is the only way to produce chickens at a price at which they are currently sold (£3.50 - £4 per bird) (12)



- There are rules about the amount of space chickens have in barns. However, some people have concerns about animal welfare
- Intensive farming can have a strong, unpleasant smell:
 - A large amount of ammonia is given off from sheds
- However, this is much less likely in modern high tech units
- Intensive rearing of chickens raises some animal welfare concerns e.g. burns caused by acidic droppings, they never go outside and do not have enough room to move around (13)

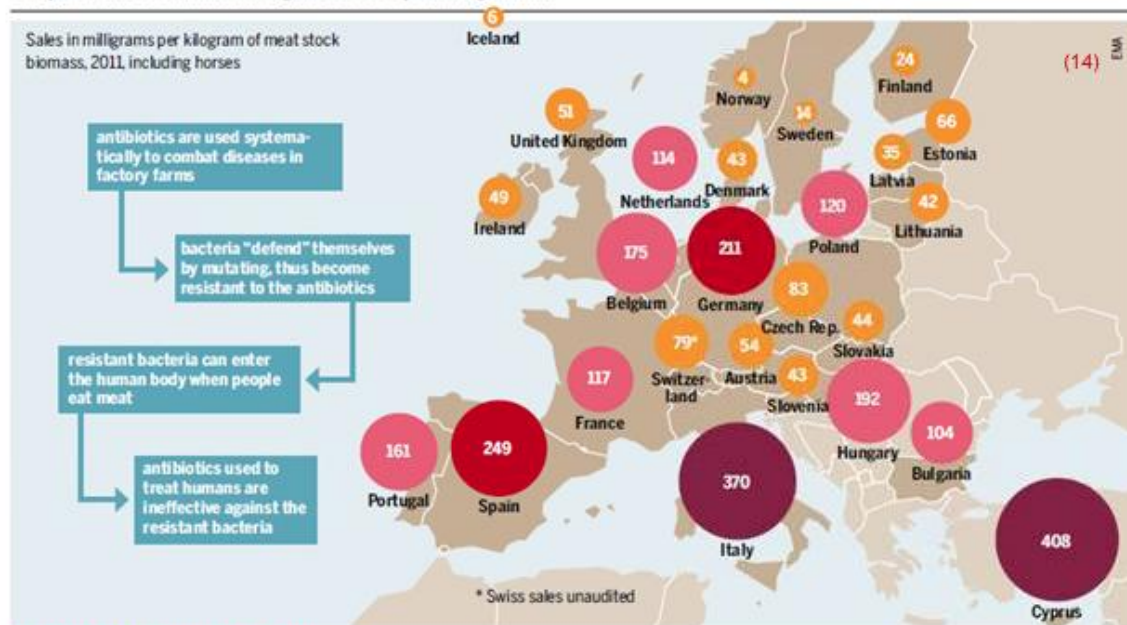
12) BBC News Online: <http://www.bbc.co.uk/news/magazine-29219843>

13) Compassion in World Farming: <http://www.ciwf.org.uk/media/5235309/Welfare-sheet-Broiler-chickens.pdf>

Use of antibiotics

- Antibiotics are used in chicken feed to help ensure healthier chickens. Antibiotics are no longer allowed to be used in the EU to promote the growth of animals but this is still done in some other countries e.g. China. However, they can be used to prevent the spread of disease

European sales of antimicrobial agents for food-producing animals



14) Report for Friends of the Earth

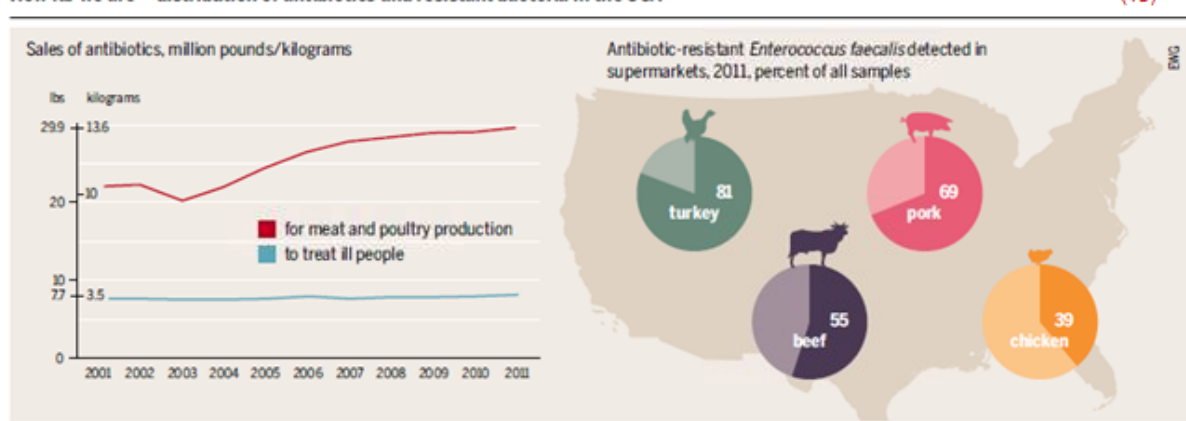
https://www.foeeurope.org/sites/default/files/publications/foee_hbf_meatatlas_jan2014.pdf

Antibiotic resistance and food safety

- But some bacteria are becoming particularly resistant to antibiotics, and these are often associated with food safety: E-coli, Salmonella and Campylobacter (Campylobacter is the biggest cause of food poisoning in the UK) (16)

How far we are – distribution of antibiotics and resistant bacteria in the USA

(15)



15) Report for Friends of the Earth

https://www.foeeurope.org/sites/default/files/publications/foee_hbf_meatatlas_jan2014.pdf

16) Biotechnology and Biological Science Research Council <http://www.bbsrc.ac.uk/research/topical/food/fighting-campylobacter.aspx> :

Food poisoning



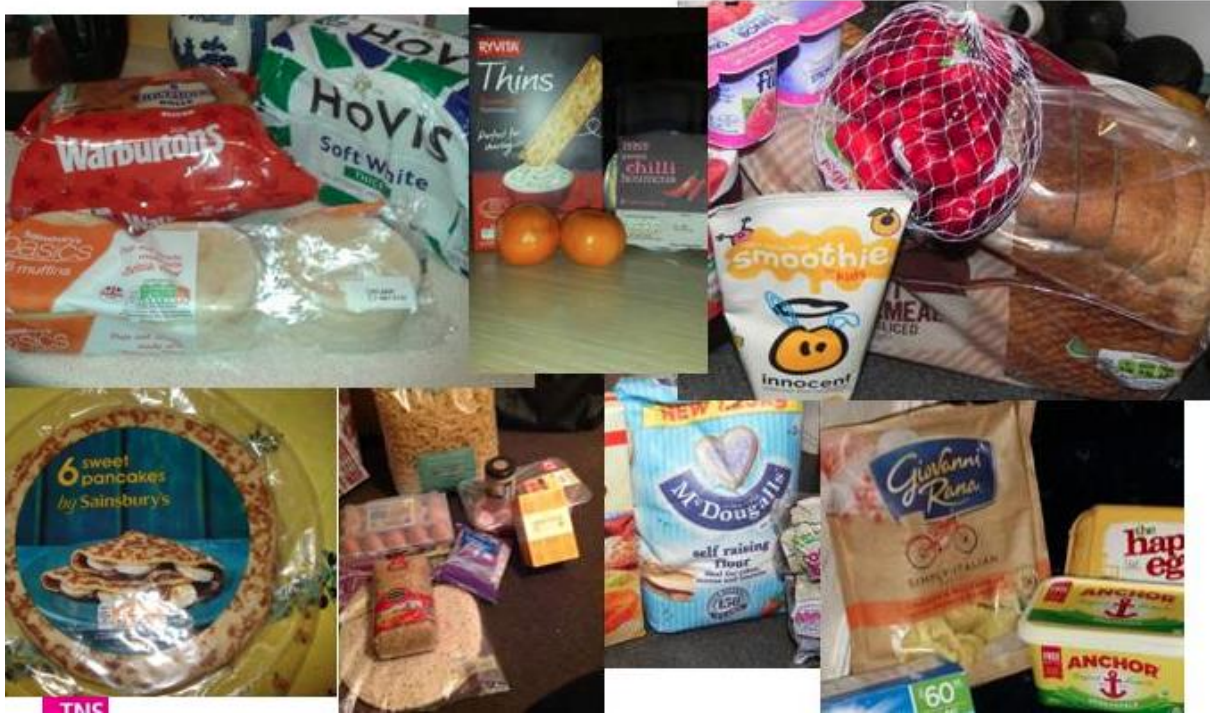
- Chickens carry a bacteria, called Campylobacter, which causes one of the most common and serious types of food poisoning
- Around 70% of chickens contain it. Even though it is not very well known, it causes more cases of food poisoning than Salmonella and E.coli put together
- It causes around 280,000 cases of food poisoning in the UK and around 110 deaths each year ⁽¹⁷⁾
- Organic and free range chickens are more likely to carry campylobacter than barn reared chickens
- You can kill Campylobacter by cooking the chicken thoroughly and following good food safety practices e.g. washing hands and utensils carefully after preparing raw chicken, never washing raw chicken, and following cooking instructions

17) Food Standards Agency www.food.gov.uk/science/microbiology/campylobacterevidenceprogramme

9. Day 1 Wheat Case Study

CASE STUDY:

Wheat Production and Consumption - the type of things you've been buying



From Wheat...



Milling and
baking
processes



... To Bread



Issues we will be considering...



Production practices



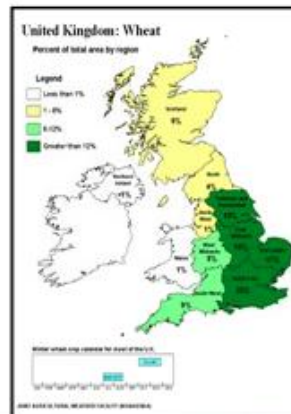
Food supply chain



Demand

How we grow wheat

- In the UK, wheat is sown on 40% of Britain's land for crops. ⁽¹⁾
 - We used to export wheat but now we need to import it
- Usually it is grown in large wheat fields and harvested mechanically



1) National Farmer's Union: <http://www.nfuonline.com/archived-content/whats-new/news/a-delicious-roast-dinner-made-in-britain/>

What is wheat used for?

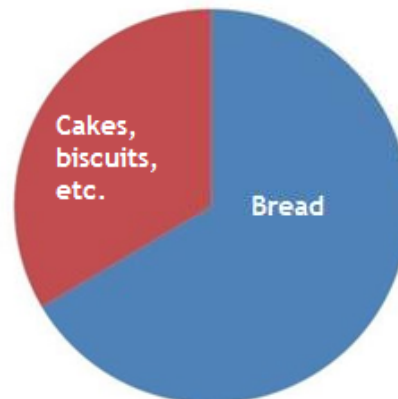
- 60% is used in the food we eat ⁽⁸⁾
- 40% is used in animal feed for chickens, cows and pigs ⁽⁹⁾



8) Nabim.org: <http://www.nabim.org.uk/flour-and-milling/nutrition>
9) UK Agriculture: <http://www.ukagriculture.com/crops/wheat.cfm>

How we eat wheat

- 99% of households buy bread - the equivalent of nearly 12 million loaves are sold each day in the UK (5)
- Over the last 20-30 years, people have been eating less bread. We now eat about 2-3 slices of bread a day (6)
- The average British household makes its way through 78 packets of biscuits a year. The most popular biscuit is the digestive; 4.4 million digestive biscuits are eaten every day (7)

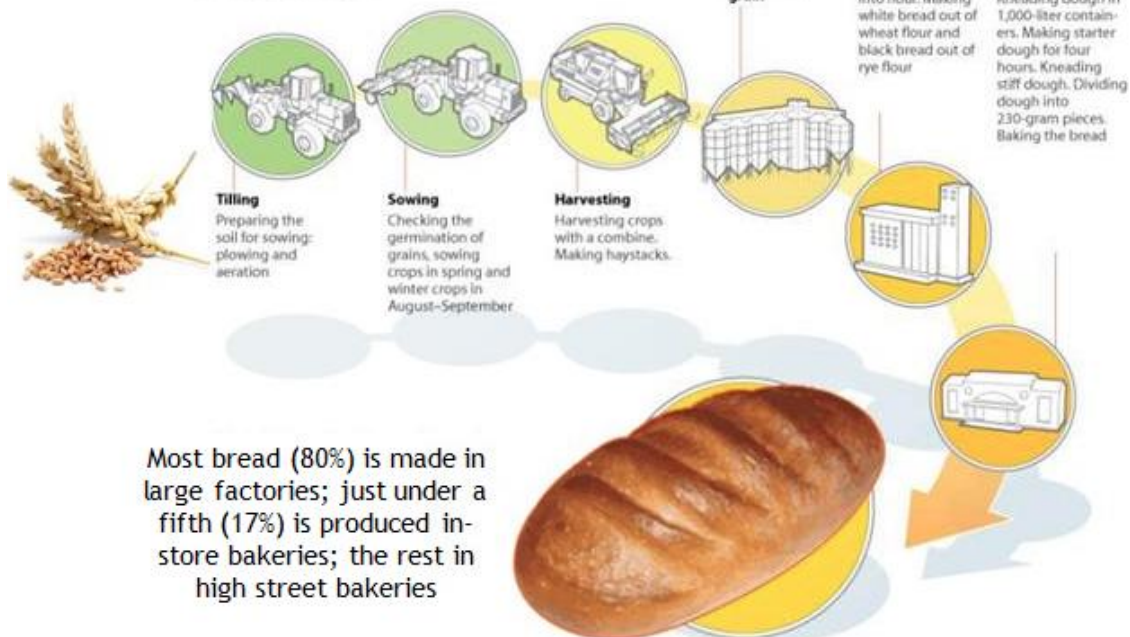


Around two thirds of the wheat we eat is made into bread. The rest is used to make cakes, biscuits and crackers etc.

- 5) The Baker's Federation: <http://www.bakersfederation.org.uk/the-bread-industry/industry-facts/2012-01-23-15-57-15.html>
 6) The Flour Advisory Bureau: <http://www.fabflour.co.uk/fab-bread/facts-about-bread/>
 7) The Guardian: <http://www.theguardian.com/lifeandstyle/2012/jun/06/crunch-time-britain-loves-biscuits>

How bread is made: from grain to loaf

The trip wheat grain takes to arrive on your table as a loaf of bread



RIANOVOSTI © 2010

2) SputnikNews: <http://sputniknews.com/infographics/20100422/158699316.html>

Manufacturers can no longer rely on always having British wheat

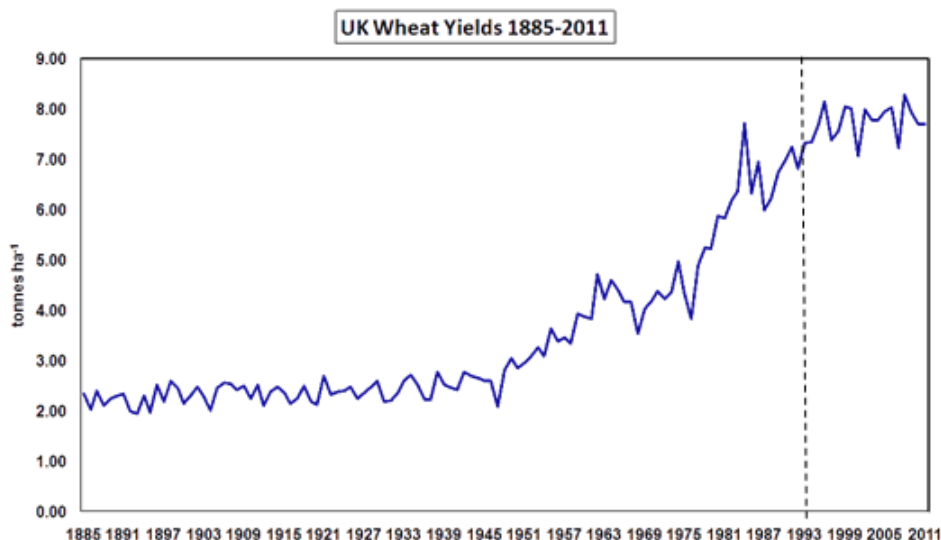
- The UK produces 15 million tonnes of wheat per year
 - We export a quarter
 - But if we experience bad weather we need to import wheat that is good enough to be turned into flour; last year we imported 1.2 million tonnes
- In 2001, 2007 and 2012, we saw big dips in production of wheat due to poor weather – in some cases whole crops were destroyed

15 million tonnes is equivalent to 10 million cars or could fill the O2 Arena (Millennium Dome) 60 times!



The amount of wheat we're growing is no longer increasing

Since the 1940s, wheat yields (the amount we grow each year) have been increasing. But over the last 20 years this has levelled off – yield in the UK is staying the same but demand is going up



SOME ISSUES TO CONSIDER:

CLIMATE
ENVIRONMENT
WATER USE
WHEAT PRICES
DISEASE
WASTE

Making a loaf of bread produces Greenhouse Gases

- Producing foods such as bread releases Greenhouse Gases into the atmosphere. Greenhouse Gases include Carbon Dioxide and Nitrous Oxide. Scientists believe that Greenhouse Gases cause global warming and affect climate.
- Producing a loaf of bread releases the same amount of greenhouse gases ⁽¹¹⁾ as a 6 mile journey in a family car!⁽¹²⁾



11) Producing a loaf of bread releases between 977 and 1244 g of Carbon Dioxide - Espinoza-Orias N, Stichnothe H, Azapagic A (2011) 'The carbon footprint of bread'. International Journal of Life Cycle Assessments (16) :351-365.

12) Average car UK car emissions from SMMT Online: <http://www.smmmt.co.uk/co2report/#responsiveTabs1>

Fertilisers used on wheat contribute to greenhouse gases

- Nitrogen based fertilisers are used to improve wheat yields (the amount grown on each bit of land)
- But nitrogen fertiliser can be responsible for the majority of emissions from growing wheat ⁽¹³⁾
- Reducing nitrogen fertiliser rates could reduce greenhouse gases but may also reduce yields ⁽¹³⁾
- There are products available to reduce the amount of nitrogen-based fertiliser needed but they are expensive

¹³⁾ Kindred et al. (2008) 'Effects of nitrogen fertiliser use on green house gas emissions and land use change' Aspects of Applied Biology 88, 2008

Modern growing techniques increases yield but may affect biodiversity*

Modern intensive farming techniques can affect biodiversity in many ways:

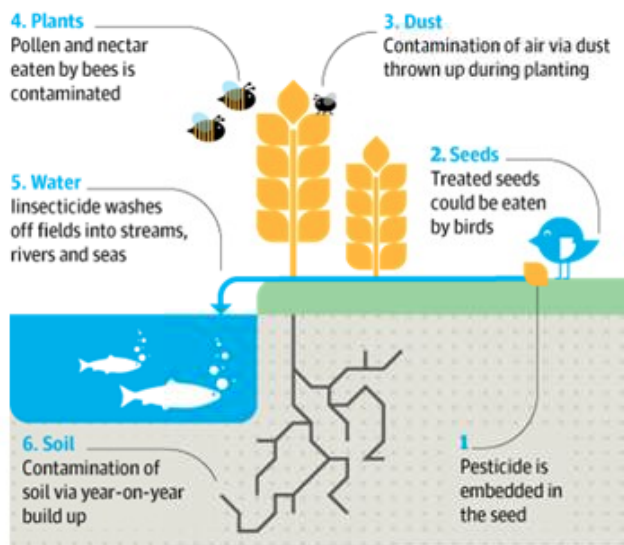
- Large single plant farms mean less space between fields for hedgerows and areas for wildlife
- Herbicides** can affect wild plant life
- Pesticides** can affect insect populations

• BIODIVERSITY is about maintaining the number of different species of plants and animals in an area
• ** Herbicides and pesticides are chemicals used to kill weeds and insects that eat crops

Systemic insecticides

(14)

How systemic insecticides can contaminate the environment. Neonicotinoids are the world's most widely used insecticides. They are used to treat seeds so the neurotoxins appear in every part of the plant



Neonicotinoids are a type of pesticide that is used to treat seeds. This means that the insecticide is present in all parts of the plant tissue as it grows (including the pollen).

Neonicotinoids are very effective at protecting plants from insects and make up about a third of the pesticides market.

Scientists at the European Food Safety Authority (15) has raised concerns that there could be a link between neonicotinoids and the decline in bee populations.

Some scientists, eg. the UK's Royal Society have disagreed with this interpretation of the evidence and are concerned that banning them could lead to reduced yields as alternatives may be less effective at dealing with pests. (15)

This has led to a temporary ban in the EU while the issue is looked into in more detail.

14) Soil Association: <http://www.soilassociation.org/wildlife/bees/beesandorganicfarming>

15) European Food Safety Authority <http://www.efsa.europa.eu/en/press/news/130116.htm>

15) Government Office for Science annual report:

https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/381906/14-1190b-innovation-managing-risk-evidence.pdf.

Wheat uses lots of water

One slice of bread uses the equivalent of two kitchen sinks of water (18 litres)- which is wasted when people throw a slice away

Although wheat is one of the crops that uses water most efficiently when it's produced, it is the second largest user of water because we consume so much bread.

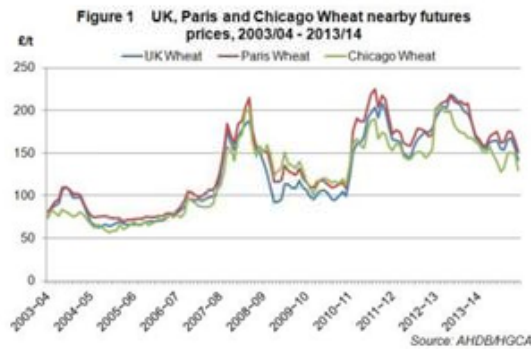
Water is a finite resource. Because we import wheat from other countries we are taking water from dry places



15) Hoekstra, A. & Hung, P. (2005) 'Globalisation of water resources: international virtual water flows in relation to crop trade' *Global Environmental Change* (15) pp.45-56

Wheat prices

- World wide wheat prices are very volatile – they go up and down all the time
- The amount we pay for wheat can be affected by bad weather in other places. For example, droughts in the US caused wheat prices to increase by 38% (i.e. £1 went up to £1.38).
- Also changing wheat prices can affect worldwide politics – for example price rises in 2007/8 were thought to have triggered the Arab Spring riots in 2010.
- Wheat prices changing can be blamed on oil shocks, droughts, increased consumption of meat in emerging markets, financial speculation (e.g. wheat is a tradable commodity)



16) Department for Food, Environment and Rural Affairs:

https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/361759/foodpocketbook-2014report-08oct14.pdf

17) African Development Bank:

http://www.afdb.org/fileadmin/uploads/afdb/Documents/Publications/Economic_Brief_-_The_Political_Economy_of_Food_Security_in_North_Africa.pdf

Disease – wheat rust



- New 'wheat rust disease' is spreading across Africa and into the Middle East and could decimate UK crops
- Farmers across the world will need to replace up to 90% of current wheat varieties with new, resistant varieties to ensure crops are protected against the fungus (18)
- Climate change means more diseases will spread over the winter period

18) Nature Online: <http://www.nature.com/news/2010/100526/full/news.2010.265.html>

Waste

Bread is the most wasted food with 1 in 3 slices being wasted by the public. ⁽¹⁹⁾

One large supermarket estimated that 50% of bakery goods were thrown away either by the store or consumers. ⁽²⁰⁾

Altering salt and sugar can extend shelf life - One consequence of lowering salt in foods for health reasons is that some products have slightly shorter-shelf lives now



19) Department of Environment, Food and Rural Affairs:

https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/137950/defra-stats-foodfarm-food-foodwastepurchases-100727.pdf

20) <http://www.bbc.co.uk/news/uk-24603008>

Waste throughout the food chain

- Nearly half of food waste occurs at the consumer stage.
- On average households amass over 5kg of food waste a week.
- This has an average annual cost of £40 per month, per household.
- Just under two thirds of the food wasted by consumers is "avoidable" (i.e. edible).



Farm level –
3 million
tonnes



Manufacturing –
3.9 million
tonnes



Retail –
0.25 million
tonnes



Hospitality /
food service
– 0.9 million
tonnes



Consumer –
7 million
tonnes – 60% is
avoidable



How waste occurs through the food chain



However, although consumers waste more food than any other group, there is wastage throughout the food chain. This is due to a number of reasons...

Production

Crops pre-harvest are lost, due to extreme weather, pests and disease. Climate change is likely to increase the prevalence of severe weather.

Some contracts require farmers to have produce available at a specified time & with a predefined amount. This can lead them to make more than is needed (as contingency). Any extra may not reach market, e.g. if they're tied into an exclusivity deal there can be few alternative markets.

Losses through farming practices and machine inefficiencies.

Products which do not meet the strict quality standards of retailers, relating to appearance, weight, colour, size and shape may be rejected. It could be used instead as animal feed. However, grading standards are being redefined, e.g. some supermarkets are now marketing "ugly" fruit & veg (which are inconsistent shapes and sizes).

Manufacturing

Loss during manufacturing include product recalls, packaging changes, labelling errors, contamination.

Retail

One of the largest challenges to retailers is ensuring there is enough stock to keep shelves full but not so much that it leads to waste. Forecasting this can be complicated by seasonality of goods, weather patterns, consumer trends, national holidays etc.

<http://www.foodsecurity.ac.uk/assets/pdfs/food-waste-report.pdf>

10. Homework task to be completed between Day 1 & Day 2

Before the group next week, we'd like you to do the same food choice exercise you did before coming today. This time we want you to note down any times when you chose something different from normal or thought about your choice a bit harder because of something you've heard today. Please also make a note of any of the following:

What you said to friends and family about the issues we discussed – and what did they say back?

Anything you saw on TV or read in the paper which made you think about the issues we discussed today?

FOOD RESEARCH TASK

Thank you for agreeing to participate in this research.

We would like you to complete this task when you have just finished a grocery shop. Please make sure you have all the shopping with you and your receipt. Please look at your receipt and note down your responses to the following questions for at least 10 different **food/drink items**:

Item I bought	Is this something you always buy (i.e. routine), an impulse buy (impulse) or something you thought more about (i.e. choice)? – please circle	Were there any specific reasons why you chose this product over another? Anything different about what you thought about when making your choice?	Did any of the following come into your decision making on this- ? Tick as appropriate
<i>e.g. Tesco frozen raspberry pavlova</i>	Routine / Choice / Impulse	<i>e.g. My son likes raspberry pavlova, it's a treat for his birthday</i>	<input type="checkbox"/> Healthy eating <input type="checkbox"/> Buying fair trade <input type="checkbox"/> Quality <input type="checkbox"/> Buying British <input type="checkbox"/> Price <input type="checkbox"/> Trust in food safety <input type="checkbox"/> Taste <input type="checkbox"/> Buying food in season <input type="checkbox"/> Animal welfare, e.g. free range <input type="checkbox"/> Buying locally produced food <input type="checkbox"/> Buying organic food <input type="checkbox"/> None of these <input type="checkbox"/> Environmental impact

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	Routine / Choice / Impulse		<input type="checkbox"/> Healthy eating <input type="checkbox"/> Buying fair trade <input type="checkbox"/> Quality <input type="checkbox"/> Buying British <input type="checkbox"/> Price <input type="checkbox"/> Trust in food safety <input type="checkbox"/> Taste <input type="checkbox"/> Buying food in season <input type="checkbox"/> Animal welfare, e.g. free range <input type="checkbox"/> Buying locally produced food <input type="checkbox"/> Buying organic food <input type="checkbox"/> None of these <input type="checkbox"/> Environmental impact
	Routine / Choice / Impulse		<input type="checkbox"/> Healthy eating <input type="checkbox"/> Buying fair trade <input type="checkbox"/> Quality <input type="checkbox"/> Buying British <input type="checkbox"/> Price <input type="checkbox"/> Trust in food safety <input type="checkbox"/> Taste <input type="checkbox"/> Buying food in season <input type="checkbox"/> Animal welfare, e.g. free range <input type="checkbox"/> Buying locally produced food <input type="checkbox"/> Buying organic food <input type="checkbox"/> None of these <input type="checkbox"/> Environmental impact

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Now please arrange your shopping in groups according to those types of things you bought for similar reasons (e.g. I always buy, trusted brands, on offer etc.) and take photographs of each group of items. Please send your photographs to Samantha.Rushforth@tns-bmrb.co.uk and state what group each represents or write down here:

Photo number	Items in it	Reason they are a group
1		
2		
3		

Photo number	Items in it	Reason they are a group
4		
5		
6		
7		

11. Day 2 Discussion Guide

Agenda item	stimulus	Content
PLENARY – WELCOME AND INTRODUCTIONS		
10:00-10:50		
Welcome and introductions (5 mins) PLENARY	NONE 3 X FLIPCHART PAPER AND PENS INTRO SLIDES	<p>LEAD FACILITATOR TO WELCOME PARTICIPANTS AND INTRODUCE THE FORMAT OF THE DAY</p> <ul style="list-style-type: none"> • Welcome participants back and thank them for returning • Re-introduce self and TNS BMRB – independent market research agency • The topic we will be talking about today is some solutions to food sustainability problems • As with last week, there is a bit to take in but hopefully should be fun and interactive • Again - it is not a test and this is not school! We genuinely want to know where you don't understand things and we want to hear your questions too • Remind about colleagues who will be observing the sessions (introduce them again), they are working with us on the project and should just blend into the background • Explain we'll will be filming the day and invite crew to explain filming • We are also recording the table discussions for our records • You each have a new WORKBOOK – this is for you to use and record your thoughts and feelings as you wish again, you will also have some structured tasks to do with the workbooks but your table facilitator will tell you about them as and when they come up • LEAD FACILITATOR TO RUN THROUGH THE OBJECTIVES AND AGENDA <ul style="list-style-type: none"> ○ <i>Explain Action Plan – At the end of this session, you will put together an action plan or your recommendations for what you would like Government, farmers, food manufacturers, food retailers and caterers to do to address the challenges we discussed last week.</i> ○ Which?, GO Science and evaluator to re-introduce themselves <p><u>Introduce discussion of homework task exercise</u></p> <p>We want to know how much your views about what we eat and where it comes from have changed (if at all) since the last group and why. We also want to know whether you have done something different (e.g. deciding what food you buy, how you prepare it, what you do with leftovers etc.)</p> <p>We want you to first get into groups and discuss what you've been thinking about in pairs, how and why you've changed, and why not. Spend a few minutes talking about what you've been thinking about since the last week. Once everyone has discussed what they'd been thinking about the week before, then one person write up responses to questions on the flipcharts (they'll also need to feedback at the end):</p> <ul style="list-style-type: none"> • What stuck in your mind and why? • What changed and why? OR Why you've stayed the same? <p>If one group is very large ask those participants to divide themselves up based on similar changes and explain why they have grouped themselves in that way when they feed back.</p> <p>Please stand by one of the flipcharts:</p> <ul style="list-style-type: none"> • Changed what I think and what I do • Changed what I think but not what I do • Did not change what I think or what I do <p>LEAVE AT LEAST 5 MINS FOR FEEDBACK</p> <p>LEAD FACILITATOR TAKES PARTICIPANTS THROUGH AROUND 10 SLIDES ABOUT WHAT THEY LEARNED LAST WEEK</p> <ul style="list-style-type: none"> • I'm just going to remind you of some of the things we looked at last week, and your responses to them • THIS PRESENTATION WILL FOCUS ON PARTICIPANTS' RESPONSES TO WHAT THEY HEARD LAST WEEK AS WELL AS REMINDING THEM OF THE TOPIC HEADINGS AND SOLUTIONS <p>Which? / GO Science will present feedback on questions from last week</p>
Exercise (10 mins)		
Recap of previous plenary (10 mins)		

<p>10:25 – 10:50 Vox pops on which solutions should be implemented and why</p>	<p>VOX POPS VIDEO</p>	<p>LEAD FACILITATOR INTRODUCE VOX POPS IN PLENARY –</p> <ul style="list-style-type: none"> We're going to tell you what the experts have to say on some of the potential solutions Tim Benton discussed last week ... EXPLAIN: <i>these people have been selected to give you an idea of the range of opinions out there on this subject. Whilst these people are well respected and knowledgeable in this area, we are not presenting these opinions as fact or asking you to decide between these. We are showing you these videos to give you a sense of the range of things people are talking about in relation to food sustainability so you can bear this in mind when feeding back your final comments on what should be prioritised going forward.</i> PLAY VOX POPS <p><u>Responses to vox pops (10 mins)</u></p> <ul style="list-style-type: none"> Facilitator asks participants to record their private responses in their WORKBOOKS Discuss expert vox pops <ul style="list-style-type: none"> What do you remember? What stood out to you? What do you agree/disagree with and why? Has this changed your view on any of the solutions – if so, why How do you know feel about the general public's role in addressing some of these issues
<p>10:50 – 11:50pm</p>	<p>BREAKOUT – CASE STUDY 1</p>	
<p>1 hour</p> <p>Intros and explaining task (5 mins)</p> <p>Case studies (55 mins)</p>	<p>PRE-TASK</p> <p>CONSUMER PRIORITIES FLIPCHART FROM WEEK 1</p> <p>A3 print out of the challenges from each case study on the wall</p>	<p><u>Facilitator introduction (2-5mins)</u></p> <ul style="list-style-type: none"> Introduce self, repeat that we are impartial market researchers Get permission to record Warmup/introductions – <ul style="list-style-type: none"> Go around the table one-by-one getting first name only MODERATOR TO REMIND PARTICIPANTS OF CHALLENGES REFERENCING CHALLENGES BOARD <p><u>INTERVENTIONS CAROUSEL TASK (25 minutes)</u></p> <ul style="list-style-type: none"> <u>Explain that there are 5 'solutions stations' around the room – these are examples, not an exhaustive list, we are interested to know what you make of these and what your hopes and fears are in relation to different types of intervention. Spend no more than 5 mins at each station. There are things for you to bear in mind on cards around the stations – make sure you think of all of these when giving your feedback.</u> As pairs then write up what you think are the key advantages and disadvantages on the flipcharts next to each on the 'solution stations'. If you're not the first pair to review that solution then you can also comment on other people's feedback on the flipcharts. <p>Ask participants to fill in their individual solutions sheet in WORKBOOK</p> <p><u>GROUPING THE SOLUTIONS – RED / AMBER / GREEN (15 mins)</u></p> <p>Ask participants in their pairs to sort solutions (2 mins)</p> <ul style="list-style-type: none"> Red (not no – but 'going towards no'), Amber (totally unsure), Green (going towards a yes) Write red, green or amber and why on card <p>Each pair feeds back which solutions they put on Red, Amber and Green and why (very briefly – 2 mins per pair). As each pair feeds back, place next to Red, Amber and Green post it on the table.</p> <p><u>DISCUSSION OF RED / GREEN / AMBER SOLUTIONS (20 mins)</u></p> <p><u>NB – in this section be sure to explore fully what is underpinning their responses, how they compare one type of solution to another and what this tells us about their underlying concerns and priorities.</u></p> <ul style="list-style-type: none"> Facilitator to stick cards on flip charts (on wall) where there is agreement. <ul style="list-style-type: none"> Note why card has been positioned there Where there is disagreement ask participants what would need to happen to take it to another sheet (e.g. from Red to Amber or Amber to Green)

		<ul style="list-style-type: none"> ○ They need to decide as a group where to position each of the cards, although reassure them they can present with caveats as necessary <p>Once all cards have been positioned (Note on FLIPCHART)</p> <ul style="list-style-type: none"> ○ For those which are red or amber what would it take to move them to green, or is that never going to happen? E.g. is there any information that participants would need to know? From who? Are there certain aspects of the solution you would like to see change in? ○ For those that are green, is there anything which would move them down a level. What about if retail price increased because of it, would consumers really accept it? (Refer back to consumer priorities chart.) ○ What role could the different groups in the food system have to make these "acceptable"? Prompt government, farmers, food manufacturers, retailers, caterers, consumers ○ How do each of these solutions help to solve the challenges we said were a priority? ○ Do we want to move any to another category in light of this conversation? <p>Nominate a pair to feedback during plenary</p>
BREAK – 11:50 – 12:00		
12:00 – 12:55pm	BREAKOUT – CASE STUDY 2	
55 mins	Change pairings	REPEAT AS ABOVE
LUNCH – 12:55-13:25		
13:25-14:15	BREAKOUT – CASE STUDY 3	
50 mins	<p>Chicken Solutions cards</p> <p>Change pairings</p>	<p>In pairs, ask participants to review the chicken solutions as hand outs and briefly discuss what they see as the pros and cons of each. They will need to put them in order from green to red by asking themselves is this solution more or less acceptable than the last? (15 mins)</p> <p>Fill in their individual solutions sheet in WORKBOOK (5 mins)</p> <p>Each pair feeds back which solutions they put on Red, Amber and Green and why (very briefly – 2 mins per pair). As each pair feeds back, place next to Red, Amber and Green post it on the table. (10 mins)</p> <p><u>DISCUSSION OF RED / GREEN / AMBER SOLUTIONS (20 mins)</u> <u>NB – in this section be sure to explore fully what is underpinning their responses, how they compare one type of solution to another and what this tells us about their underlying concerns and priorities.</u></p> <ul style="list-style-type: none"> ○ Facilitator to stick cards on flip charts (on wall) where there is agreement. <ul style="list-style-type: none"> ○ Note Why Card has been positioned there ○ Where there is disagreement ask participants what would need to happen to take it to another sheet (e.g. from Red to Amber or Amber to Green) <ul style="list-style-type: none"> ○ They need to decide as a group where to position each of the cards, although reassure them they can present with caveats as necessary <p>Once all cards have been positioned (Note on FLIPCHART)</p> <ul style="list-style-type: none"> ○ For those which are red what would move these to amber? <ul style="list-style-type: none"> ○ Make a note of caveats e.g. any information that participants would need to know? From who? Are there certain aspects of the solution that would need to change ○ What role could the different groups in the food system have to make these

		<p>"acceptable"? Prompt government, farmers, food manufacturers, retailers, caterers, consumers</p> <ul style="list-style-type: none"> ○ If they say this is never going to happen? Why not ○ For those which are amber what would it take to move them to green? <ul style="list-style-type: none"> ○ Make a note of caveats ○ What role could the different groups in the food system have to make these "acceptable"? Prompt government, farmers, food manufacturers, retailers, caterers, consumers ○ If they say this is never going to happen? Why not ○ For those that are green, is there anything which would move them down a level. What about if retail price increased because of it, would consumers really accept it? (Refer back to consumer priorities chart.) ○ How do each of these solutions help to solve the challenges we said were a priority? ○ Do we want to move any to another category in light of this conversation? <p>Nominate a pair to feedback during plenary</p>
14:15- 14:45	PLENARY – FEEDING BACK CASE STUDY PRIORITIES AND SOLUTIONS	
14:15– 14:45	SOLUTIONS FLIPCHARTS	<ul style="list-style-type: none"> • Each group presents RED / AMBER and GREEN for each case study (15 mins each including responses) <ul style="list-style-type: none"> ○ i.e. Talks though which solutions are under each and why
BREAK – 14:45-14:55		
14:55- 16:10	BREAKOUT – ACTION PLAN TASK	
15:55 – 15:15	<p>Challenges FC from Day 1</p> <p>Consumer priorities FC from Day 1</p> <p>Solutions boards – with challenges slide</p>	<p>Explain - We are about to ask you to write your action plans – this is your chance to feedback what you think are the most important challenges and what solutions you think should be used to address these. To help you do this, we are going to spend a bit of time recapping on what you've said about:</p> <ul style="list-style-type: none"> • The challenges in the food system • Your priorities as consumers <p>Refer participants to their consumer priorities from Day 1 (read through these briefly)</p> <ul style="list-style-type: none"> • How do you feel about these now • Would you add any based on changes between weeks 1 and 2 <p>Refer participants to priority Challenges from Day 1 :</p> <ul style="list-style-type: none"> • How do you feel about these now • Would you add any or change the order at all <p>Remind – When you do your action plans in a moment, you will need to think about the challenges you thought were most pressing so you will want to refer back to these flip charts.</p> <p>Show boards of different solution types and explain we have looked at solutions for different case-studies but there are types of solutions which cut across all. We could have chosen other foods and there would be examples for these different types of solution for them too.</p> <p>Discussion of different solutions groupings:</p> <ul style="list-style-type: none"> • Where there is consistency i.e. all / mainly reds or greens – what makes these types of solution more / less acceptable? • Where there is contradiction – why, what makes this more / less acceptable in one case and not the other? • How do you feel in general about this type of solution • To what extent does this differ according to the application and what makes the difference <ul style="list-style-type: none"> ○ E.g. is biotech ok for animal feed but not for wheat and if so why

<p>15:15-16:10</p> <p>Response to perspectives on food sustainability challenges (AT TABLES) 50 mins</p>	<p>WORKBOOK</p>	<p><u>Action plan – facilitated prioritisation exercise (45 mins)</u></p> <ul style="list-style-type: none"> • Facilitator to divide table up into 2 mini groups, Give each mini group: <ul style="list-style-type: none"> ○ Action Plan ○ Action Plan instructions ○ Solutions Board ○ Challenges Board <p>Make sure they know which is which</p> • They must work together to develop an action plan • Show action plan and explain <ul style="list-style-type: none"> ○ START BY THINKING ABOUT WHAT ARE THE MOST IMPORTANT CHALLENGES YOU THINK NEED TO BE ADDRESSED <ul style="list-style-type: none"> ▪ Look back at the challenges sheet and flipchart to remind yourself ○ THEN DECIDE WHAT SOLUTIONS CAN BE APPLIED TO ADDRESS EACH CHALLENGE <ul style="list-style-type: none"> ▪ Look back at the solutions boards and the red, amber and green flip charts you did for Beef, Chicken and Wheat ○ WHEN DECIDING THE SOLUTIONS YOU CAN INCLUDE: <ul style="list-style-type: none"> ▪ SOLUTIONS YOU THINK SHOULD BE ADDRESSED WITHOUT ANY CHANGES – (I.E. MENTION A GREEN SOLUTION) ▪ SOLUTIONS YOU THINK COULD WORK WITH SOME CAVEATS (I.E. MENTION AN AMBER SOLUTION AND A CAVEAT THEY CAME UP WITH) ▪ SOLUTIONS THAT YOU THINK SHOULD NOT BE APPLIED UNLESS THERE ARE IMPORTANT RESTRICTIONS APPLIED (I.E. MENTION A RED SOLUTION) ○ THEN YOU NEED TO WRITE UP WHAT YOU THINK GOVERNMENT, MANUFACTURERS, RETAILERS, FARMERS AND CONSUMERS NEED TO TAKE RESPONSIBILITY FOR <ul style="list-style-type: none"> ▪ Refer back to your workbooks, where you wrote what you would say to these groups. <p>When doing the exercise, please refer to</p> <ul style="list-style-type: none"> • Your consumer priorities and challenges • The solution boards • The notes you made in your workbooks
<p>16:10-17:00 PLENARY – FINAL FEEDBACK AND THANK AND CLOSE</p>		
<p>Feedback on action plans (45 mins)</p>	<p>NONE</p>	<ul style="list-style-type: none"> • Each mini-group then pitches their action plan to the others (5 mins) • Each group has a few minutes to ask questions or challenge or disagree <ul style="list-style-type: none"> ○ Researcher to probe fully on reasons why people disagree to understand what is underpinning their responses and priorities: e.g. why they think certain solutions are inappropriate, under what circumstances would they be appropriate, whether they think other issues were more pressing ○ Encourage presenting group to respond to opposing opinions • A representative from Which? / GO Science responds to the action plans
<p>Thank and close (5 mins)</p>	<p>NONE</p>	<ul style="list-style-type: none"> • Lead facilitator thanks participants for their contributions • Which? / GO Science to say Thank You and advise re. Next steps • Final paperwork will be completed and incentives

12. Day 2 Participants workbook



Participant workbook

Name:

Which? And Government Office
for Science research into food

Location:

DAY 2 – Welcome Back!

Date:

3

Beef Solutions – thinking about all the solutions you’ve seen relating this food what conversations would you have with the following people

What I’d say to manufactures (questions you’d have for them, things you’d want to say to them, anything else)...

What I’d say to retailers (questions you’d have for them, things you’d want to say to them, anything else)...

What I’d say to caterers (questions you’d have for them, things you’d want to say to them, anything else)...



Beef Solutions – thinking about all the solutions you’ve seen relating this food what conversations would you have with the following people

What I’d say to farmers (questions you’d have for them, things you’d want to say to them, anything else)...

What I’d say to Government (questions you’d have for them, things you’d want to say to them, anything else)...

What we as consumers need to think about

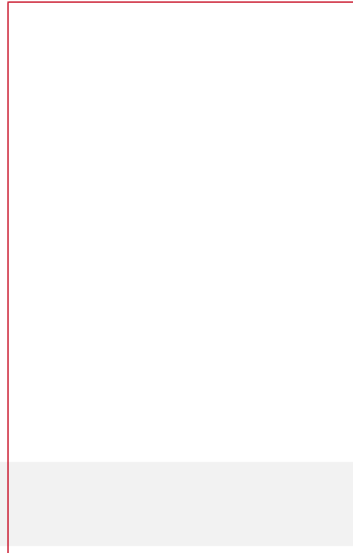


Chicken Solutions – thinking about all the solutions you’ve seen relating this food what conversations would you have with the following people

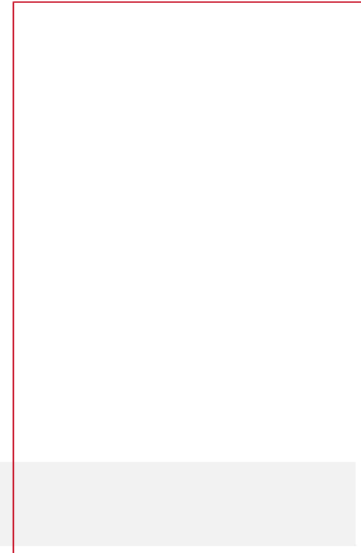
What I’d say to manufactures (questions you’d have for them, things you’d want to say to them, anything else)...



What I’d say to retailers (questions you’d have for them, things you’d want to say to them, anything else)...




What I’d say to caterers (questions you’d have for them, things you’d want to say to them, anything else)...



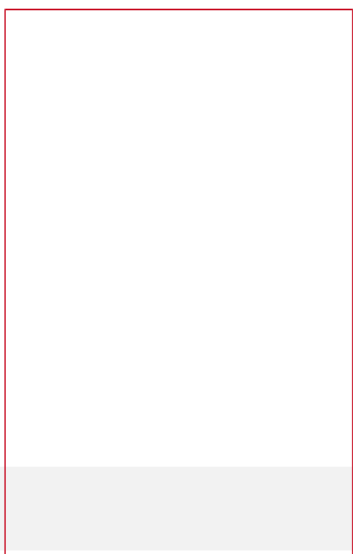
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Chicken Solutions – thinking about all the solutions you’ve seen relating this food what conversations would you have with the following people

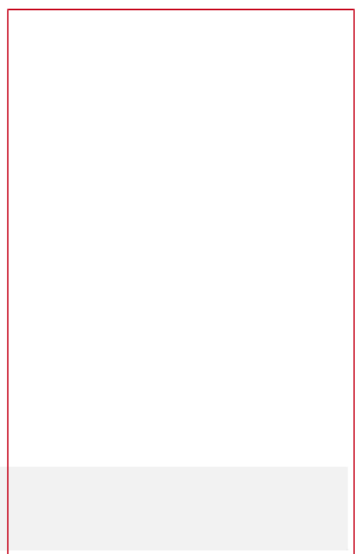
What I’d say to farmers (questions you’d have for them, things you’d want to say to them, anything else)...



What I’d say to Government (questions you’d have for them, things you’d want to say to them, anything else)...



What we as consumers need to think about



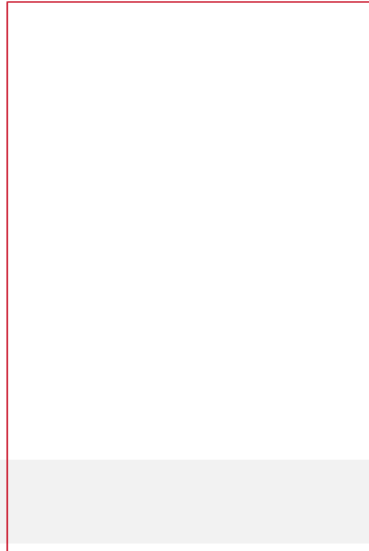
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Wheat Solutions – thinking about all the solutions you’ve seen relating this food what conversations would you have with the following people

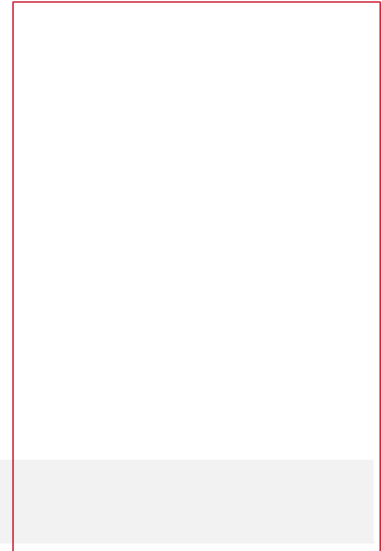
What I’d say to manufactures (questions you’d have for them, things you’d want to say to them, anything else)...



What I’d say to retailers (questions you’d have for them, things you’d want to say to them, anything else)...



What I’d say to caterers (questions you’d have for them, things you’d want to say to them, anything else)...



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Wheat Solutions – thinking about all the solutions you’ve seen relating this food what conversations would you have with the following people

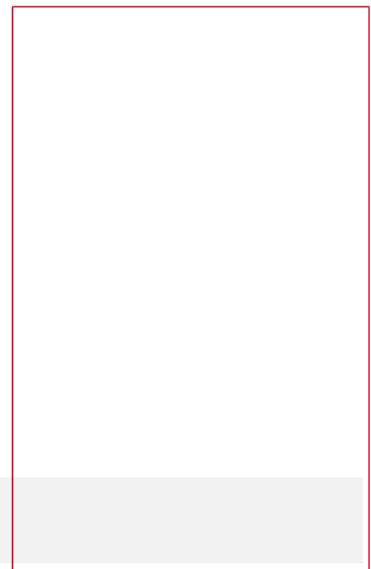
What I’d say to farmers (questions you’d have for them, things you’d want to say to them, anything else)...



What I’d say to Government (questions you’d have for them, things you’d want to say to them, anything else)...



What we as consumers need to think about



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An overview of how food technologies are currently regulated

General approach

The level of regulation of different food technologies will depend on what stage they are in development. Legislation has often been updated as new technologies are developed.

There is a general requirement that all foods should be safe under our Food Safety Act (which is in line with the EU general food law regulation), but more specific rules can apply when dealing with new types of foods or processes – as well as for things like food additives, pesticides and packaging materials.

In general, foods that are considered new or novel (for example, haven't been on the market for sale before) are covered by an EU regulation on novel foods. This requires that certain foods and processes have to be assessed as safe and then approved before they can be sold.

This regulation is currently under review to try and make sure it includes all relevant types of food and technology. It is also proposed that scientific safety assessments will be done centrally through the European Food Safety Authority. Currently they are done in the EU country where the relevant food is first going to go on the market. It would still be up to individual EU Member States to decide whether or not a product should be approved, taking into account the safety assessment and any other relevant issues. There can be different views about how much weight is given to the scientific assessment and other factors, such as ethical or economic issues for example.

Cloning of animals is being looked at as part of this review. It is likely that there will be a separate proposal. Discussions within the European Parliament and between EU member states are focusing on how far controls should go – for example whether approval and labelling is needed for the offspring of clones (eg. from a clone bred with a conventional animal) or just clones.

Specific regulations

Some types of technology have more specific regulation. There are, for example, specific rules on GM food and animal feed, both for whether GM crops can be grown and whether they can be used in food or feed. There has to be an assessment for their safety and environmental impact. This is done by the European Food Safety Authority. Member States then decide whether to give approval for their use. Because Member States have had different views about whether GM crops should be grown, a law has recently been passed that will mean that the scientific assessment will still be done EU-wide, but that individual member states will be able to decide whether or not they should be grown in their countries and, if so, what controls need to be in place.

Labelling

Specific labelling rules also apply for certain technologies. Irradiated foods for example have to be labelled. GM foods have to be labelled where they contain more than 0.9% Gm material. The debate is still on-going about whether the products of clones and their offspring would need to be labelled.

Which? and Government Office for Science



Which?

Which? is the largest consumer organisation in Europe with over 800,000 members. We operate as an independent, a-political, social enterprise working for all consumers and funded solely by our commercial ventures. We receive no government money, public donations, or other fundraising income. Which?'s mission is to make individuals as powerful as the organisations they have to deal with in their daily lives, by empowering them to make informed decisions and by campaigning to make people's lives fairer, simpler and safer.



**Government
Office for Science**

The Government Office for Science (GO-Science) exists to ensure government policies and decisions are informed by the best scientific evidence and strategic long-term thinking. Our responsibilities include:

- giving scientific advice to the Prime Minister and members of the Cabinet, through a programme of projects that reflect the priorities of the Government Chief Scientific Adviser
- ensuring and improving the quality and use of scientific evidence and advice in government (through advice and projects and by creating and supporting connections between officials and the scientific community)
- providing the best scientific advice in the case of emergencies, through the Scientific Advisory Group for Emergencies (SAGE)
- helping the independent Council for Science and Technology provide high level advice to the Prime Minister



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13. Introduction to Day 2 workshop presentation

Public Dialogue on Food System Challenges

Week 2

Welcome Back!



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Why we are doing these events

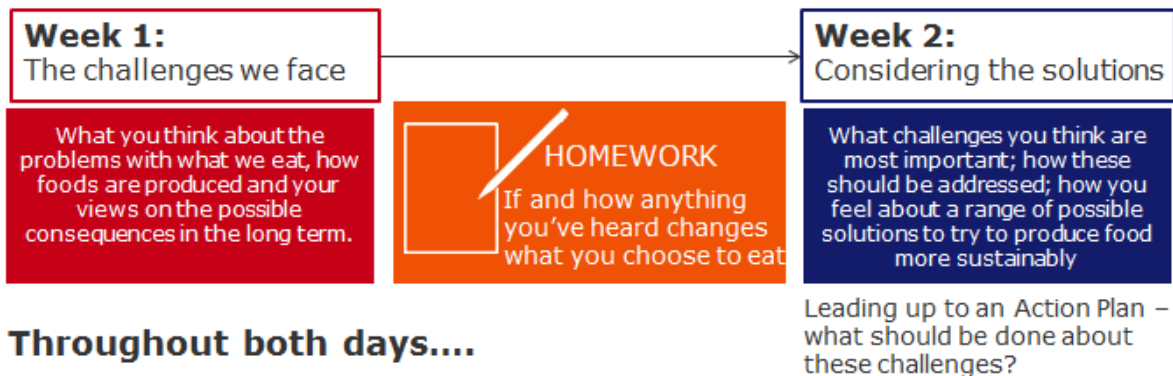
We've been asked by Which? and Government Office for Science to do this research, they want to know:

- What you know about the diets people eat and where our food comes from?
- What are your priorities when it comes to food i.e. what do you think about most when deciding what to eat and what worries you?
- How you feel about the challenges in the current food system? (i.e. the problems we may face if we continue to produce and consume food in the way we do now)
- Whether you think something needs to be done and if so what are the most important issues to address?
- What you think about different potential solutions and what solutions (if any) you think should be prioritised and why?

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A reminder - How the events will work

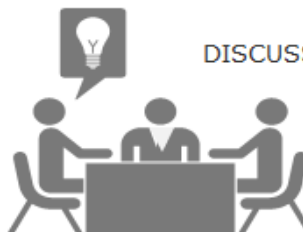


Throughout both days....



EXPERT VIDEOS

Input from recognised experts from a variety of relevant organisations. To give a range of perspectives on the issues at hand.



DISCUSSION AND EXERCISES

A chance for you to discuss, reflect and feedback – Interactive and fun!

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Introducing Which? and Government Office for Science

Which?

- Who we are
- Why we commissioned this research
- How we will use the findings
- Role of the Advisory Group, who was on the advisory group, what they are interested and how they've helped us develop the research



Government Office for Science

- Who we are
- Why we commissioned this research
- How we will use the findings
- Role of the Government Management Group, who was on the Government Management group, what they are interested and how they've helped us develop the research



Role of the experts, what are their credentials and how they were selected.

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4

Week 2 Agenda

PLENARY	Welcome and recap on last week	10:00-10:50
BREAKOUT	Case study 1 – Priority solutions	10:50-11:50
	Coffee Break – 11:50-12:00	
BREAKOUT	Case study 2 – Priority solutions	12:00-12:55
	Lunch – 12:55 – 13:25	
BREAKOUT	Case study 3 – Priority solutions	13:25-14:15
PLENARY	Feeding back case study priorities and solutions	14:15-14:45
	Tea Break – 14:45-14:55	
BREAKOUT	Action plan task	14:55-16:10
PLENARY	Feedback action plans and close	16:10-17:00



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2

RECAP ON LAST WEEK



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Recap on last week

Last week focussed on the Challenges in the food system (i.e. what we eat and how it is farmed, manufactured and gets to our plates.) You heard about the following issues:



RISING POPULATION AND POTENTIAL SHORTAGES

YOU HEARD



By 2050, the world may demand 60-100% more food (up to double what we produce now)

The UK may not always be able to guarantee supply of foods, particular as extreme weather events here and in other parts of the world effect our supply.

YOU SAID

That sounds very worrying. Could be grim. How are we going to be able to increase food production...?

OBESITY AND DIET RELATED ILLNESS

YOU HEARD

60% of the UK adult population and 30% of children are overweight or obese. Very few people eat a balanced diet as recommended

We're eating too much food that is high in sugar and fat and not enough fruit and veg and starchy foods.

Some people think that diet related illnesses might bankrupt the NHS

YOU SAID

Healthy food is important to us – but 'convenience' is compelling, especially for busy families

Supermarket offers lead us to buy on impulse and make quick choices, often 'unhealthy'

FOOD PRICES AND AFFORDABILITY

YOU HEARD



Some people really struggle to afford food. 1 million accessed food banks last year.

But, low prices are encouraging others to buy too much or buy unhealthy foods.

YOU SAID

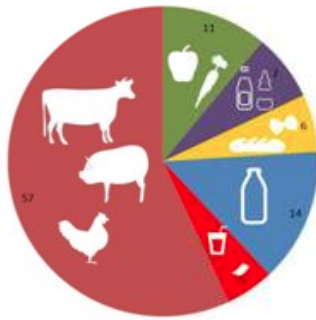
Some people really do struggle to afford food – and prices can fluctuate quite significantly on basic foodstuffs

CLIMATE CHANGE

YOU HEARD

By 2050, agriculture will account for 2 degrees of global warming due to Greenhouse Gas emissions.

This is all the world has signed up to before climate change becomes dangerous.



Over half of Carbon Dioxide emissions come from meat and another 14% from dairy

YOU SAID

We need to get rid of some cows. People should eat less beef

To reduce emissions, food consumers must change their expectations and demands

ENVIRONMENT

YOU HEARD



- 35% of the Earth's land surface is already used for agriculture
- Agriculture is responsible for 75% of global deforestation
- Livestock grazing uses more land than any other human activity
- Pesticides and herbicides effect biodiversity (the variety of species of plants and animals in an area)

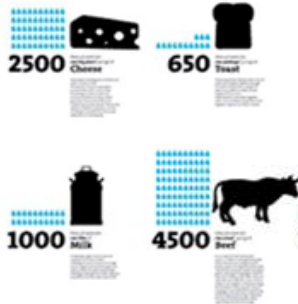
YOU SAID

We must reduce the damage from chemicals used on crops. Can we develop 'friendlier' ones, or use natural bugs to control pests instead?

We're shocked by the amount of land and feed needed to rear meat, compared to crops

WATER

YOU HEARD



Everyday foods contain embedded water. For example a loaf of bread requires 45L of water to produce

YOU SAID

The better management of water would need to be overseen globally, with all nations considering 'water' together.

When we import food we are sometimes taking water from drought prone countries.

WASTE

YOU HEARD



When we waste food, all the resources that have been used to make it goes to waste too.

If people wasted less, they could afford to buy better quality and higher priced.

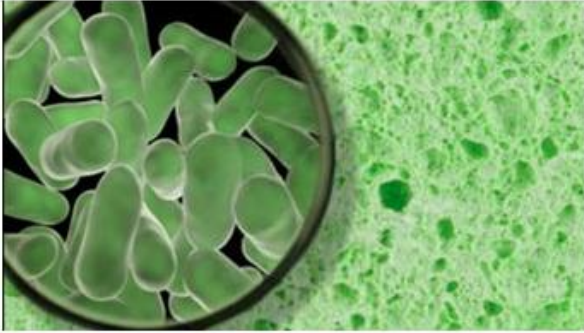
YOU SAID

Consumer wastage increases profit for food retailers.

Today's increased choice – eg many types of fresh bread – encourages wastage by consumers. Maybe we should make do with less choice?

Cheap food is linked to wasteful culture.

FOOD SAFETY



Chickens carry Campylobacter, which is one of the main causes of food poisoning, even though it is not well known. It is more prevalent in organic chickens.

You were worried about the safety of chemicals used in food production.

Campylobacter makes us feel uneasy. We lack knowledge. Chicken producers are untrustworthy...?

We might run out of effective antibiotics for treating humans, if producers continue to dose intensively reared chickens.

ETHICS AND ACCEPTABILITY

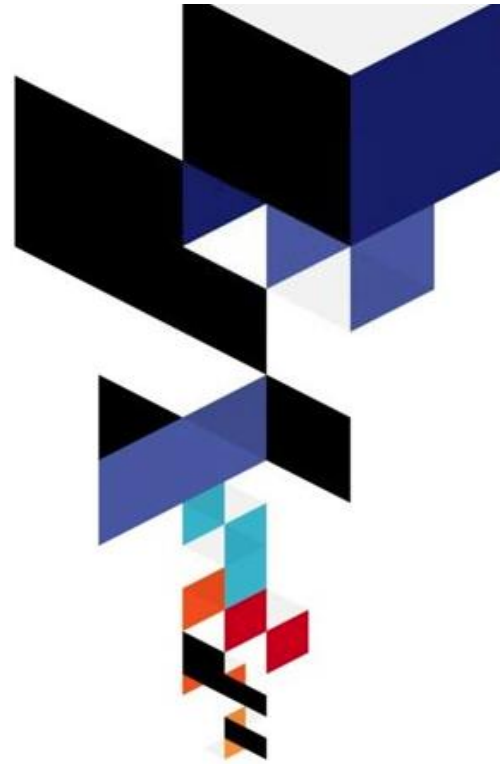


Experts questioned whether the food system was fair for all – workers are paid badly and not everyone can afford or access a good diet, while others have too much.

Animal rearing practices meant that cattle and chickens were slaughtered earlier than you expected and kept in conditions that were worse than some expected.

Animal welfare is an issue for intensively reared animals

Possible solutions



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Using new technologies to improve yields and reduce the energy, fertilisers and pesticides needed to grow food



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Looking at other possible sources of proteins –
Lab produced meat? Or Insects?



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Or thinking about changes we can make to eat more
healthily and sustainably...



Eating less but better

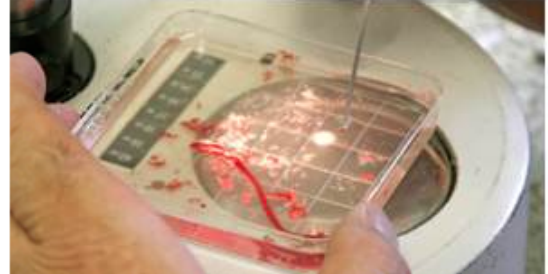
14. Day 2 Beef Solutions

Biotechnology and Beef

Biotechnology can be used in beef production in a variety of ways – some aspects have been happening for a while; others are newer approaches.

Artificial Insemination (AI) for example, has been used commercially as early as 1937. The process reduces the number of breeding bulls required and ensures only the superior male genetics are passed on and reduces venereal disease amongst cattle stocks.

More modern forms of biotechnology include **In-Vitro Fertilisation. (IVF)** is used when problems with reproductive systems are encountered. IVF also makes it easier to introduce new and higher quality genes into a herd, by fertilising cows in one herd with eggs from cows in another.



Technology is developing so that specific genes that are responsible for certain traits or characteristics can be identified. It is possible to genetically modify or alter in this way – although this is not happening commercially yet.

Using **cloning techniques**, scientists can produce animals that are genetically identical. It is possible to create exact genetic copies of animals with desirable characteristics to introduce those genes into other herds. Cloning is still in an early phase, is very expensive and is not always successful. The offspring of these animals are most likely to be used commercially (e.g. where a clone is bred with a more conventionally produced animal)

Biotechnology Case study - Embryo Transfer

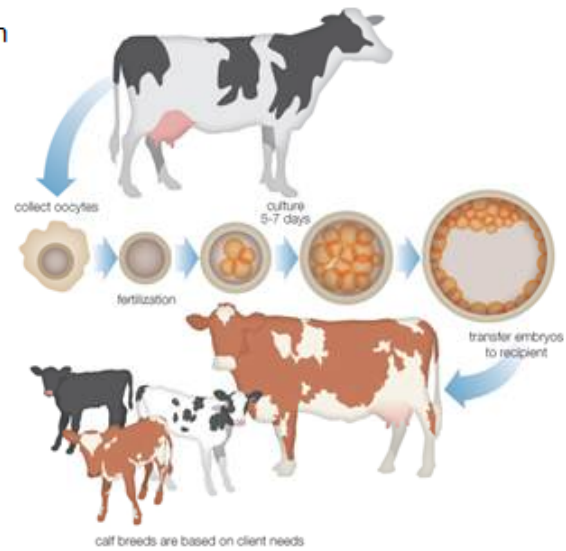
This technique takes embryos from a superior female specimen and transfers them to a lesser female cow.

Scientists can take thousands of eggs from one cow, fertilise them in a lab and then use IVF to implant the fertilised eggs into other cows to act as surrogates.

This allows farmers to produce large numbers of calves from a single cow which would not be possible using conventional breeding.

This process can be used to strengthen the genetic make up of a herd or grow the population of rare cattle breeds.

Embryos can be sold internationally which allows producers to acquire new breeds of cattle without having to physically import animals.



Eating Lab produced meat



Scientists start by taking a small sample of muscle tissue from a cow. It's a small procedure which does not harm the cow. They isolate a single muscle cell, this cell can then be *cultured* (which is the term scientists use when they get cells to divide and multiply in a lab). The cells naturally form small strands, these strands are layered around a tube of gel to form muscle tissue. (1)

1 <http://culturedbeef.net/resources/#other>

Eating meat produced in a lab would significantly reduce the land use (by 99%), water use (by 82%-96%) and Greenhouse gas emissions (by 78% - 96%). There are also potential animal welfare benefits as meat is produced in the lab and only requires a small sample of tissue to be taken from the cattle.

Lab produced meat can be produced near towns and cities and so reduces carbon emissions via transportation.

It requires less energy (per calorie and unit of protein) than beef and sheep, but it is higher than milk, eggs, poultry and pork.

But, other alternative protein sources are available e.g. soya, Quorn which some feel are healthier, safer and more ethical.

Eating Insects



Ento box contains cubes made from insects.

Ento is a London based food start-up company, looking to create insect foods which are enjoyable and feel normal.

Insects contain high quality protein, vitamins and amino acids for humans and are already eaten in some parts of the world. They are also very efficient, e.g. crickets need six times less feed than cattle, four times less than sheep, and twice less than pigs and broiler chickens to produce the same amount of protein.

Insects produce less greenhouse gases than conventional livestock and can be grown on organic waste (like manure or animal by-products e.g. carcasses) – thereby reducing waste from other food production. But, feed production, heating the breeding chambers and distribution will all contribute to greenhouse gas emissions.

Insects can be eaten whole, used as ingredients or turned into 'protein flour' which can be added to other food to increase the protein and vitamin content.

Whole insects can currently be sold in the EU but different countries may apply different safety rules depending on whether they define insects as a 'novel' food – i.e. as a food that is yet to be established as fit for human consumption. In the UK, insects are sold more as a novelty food (for example, packaged as a bush tucker trial with an 'I'm a celebrity' logo)



Eating less meat

There are lots of ways people can make a commitment to eat less meat – it's not about going completely vegetarian, it's about regularly eating less meat or having meat free days.

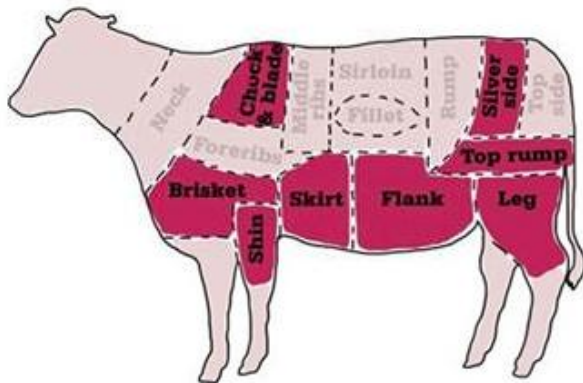


Websites like these ask people to make a pledge to cut down the amount of meat they eat – or to eat less, but better quality meat. Alternatively people can cut down their meat portion and add more vegetables to meals like curries or stews.

Manufacturers could also help by reducing the amount of meat and increasing the vegetable content in ready meals.



Eating different cuts of meat



Consumers can help to reduce meat waste by buying different cuts of meat.

Jamie Oliver's Save Our Bacon campaign encouraged consumers to eat different cuts of pork, including shoulder, belly and neck.

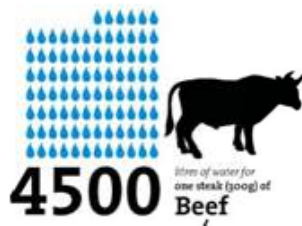
Eating cheaper cuts of meat and offal (e.g. heart, liver, kidney, brain, etc.) can also reduce food bills



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Labelling meat sustainability



There are already lots of labels to help people think about sustainability – but research has shown people spend very little time (7 seconds) looking at products before they buy.

One option may be to have a single approach to labelling that brings together a range of issues that effect sustainability including: CO2 emissions; water use; animal welfare; fair trade; packaging and waste; and impact on biodiversity.

Labelling matters is a campaign for clear honest labelling which shows how meat was reared – so that consumers know how the animal was kept.



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15. Day 2 Chicken Solutions

Feed practices – Alternative protein sources

Scientists are looking at different ways to reduce the environmental impact of feed for chickens.

It has been suggested that animal by-products, e.g. left over or spoiled meat from other species, could be used as food source for chickens to reduce waste.

It has been argued, for example, that it could help deal with slaughterhouse waste. There is EU legislation in place that does not allow this at the moment.



Another suggestion has been to breed insects which could then be fed to chickens. This doesn't happen at the moment and there would need to be safety assessment and approval at EU level first.



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Feed practices – Alternative Protein sources case study



AgriProtein Technologies, who are based in South Africa, have established an insect farm where leftover food from factories, animal excrement and slaughter house by-products are used to breed three types of flies.

The larvae of the flies is then dried and turned into an animal feed called MagMeal.

- Larvae are extremely rich in protein, fatty acids and nutrients, providing a more complete source of protein than vegetable based feeds (including soy)
- While soy plantations require vast amounts of water and land, waste for insects is widely available
- Nutrient-rich fertilizer is also generated in the process of making MagMeal



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GM Soya as feed



Soya is a major source of feed. GM soya is now grown in some countries, such as the US and South America and some of this is already used in feed in the EU and UK, depending on supermarket and manufacturer policies.

Examples of genetic modification of soya include:

- transferring genes into the soya so that it becomes **resistant or tolerant to weed killers** (also called herbicides). The purpose is to enable the weed killer to kill weeds without damaging the soya itself.
- making crops **resistant to insects** by inserting a gene from a bacteria that then makes the plant toxic (poisonous) to certain types of insect that are known to be a particular problem.

Some varieties of GM soya have been safety assessed and approved for import and use in Europe as animal feed.

Some farmers want to use this type of soya because it is cheaper. A large amount of the world's soya is now GM and so non-GM supplies attract a price premium. The reason farmers use it in other countries is because they think it makes crop management easier e.g. through less use of pesticides and weedkillers.

Others, such as some environmental groups, are concerned about the environmental impacts in countries where it is grown (GM Soya is not grown in the UK). Others are worried about food safety issues that we don't know about yet of eating chicken that has been fed GM crops. ²



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Preparation controls to reduce campylobacter

Rapid Surface Chilling

Each chicken carcass is exposed to extreme cold (close to -200°C) for a short period (20-30 seconds). This produces a 'cold shock' to the bacteria on the surface of the chicken without freezing the bird. This process reduces campylobacter levels by 90-95%

Lactic acid wash

Lactic acid is a chemical which can be sprayed onto the chicken before it is chilled and could reduce levels of campylobacter on the outside of chickens by 38%. Lactic acid is used for other purposes in food production already. It is used to ferment milk and turn it into yoghurt. Other organic acids such as citric acid found in lemons and limes could also be used.

Chlorine wash

Currently in the European Union chickens are only allowed to be washed with water in the processing plant. In other countries (inc. USA) anti-bacterial washes are allowed, including the use of chlorine which may help reduce levels of campylobacter. The US does still have high rates of campylobacter.

In the UK there are greater controls at each stage of production compared with US where they rely more on treatments at the end of the process

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Processing methods – Mechanically Separated Poultry



After meat portions (thighs, fillets, legs etc.) are removed from a chicken there is often a fair amount of meat left on the carcass. This can be separated from inedible parts (like bone) using machines. There are two types:

- when the carcass is squeezed through a machine like a sieve (it looks like a paste);
- Desinewed meat, when the carcass looks more like mince meat and has to be frozen

Products made using MSP reduce waste and maximise the calories from one chicken. However, it is largely used in highly processed products like hotdogs and nuggets.

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Better packaging



Improving packaging can help the environment by minimising the amount of plastic required and reducing waste by extending the shelf life of chickens.

Freshness labelling uses sensors to check that food is safe to eat. The label could use traffic lights for freshness or simply turn red when food was no longer safe.

Roast in the bag chicken also minimises risk from food poisoning as there is no need to handle the chicken before it goes in the oven. This reduces the risk that people contaminate other foods or surfaces when preparing the chicken.

Selling chicken in portion packs allows people to use half now and freeze the other half without opening both sides of the pack.

16. Day 2 Wheat Solutions

Biotechnology



Biotechnology covers a wide range of technologies that food scientists and farmers can use to make crops more hardy and efficient.

Farmers have used selective breeding for many years to bring out useful traits in their crops. This involves selecting plants that are more resistant to diseases or require less fertiliser and breeding these so that more of their crop inherit this trait.

Biotechnology enables scientists to identify the genes that control different traits – so they can identify what specific gene makes one plant resistant to diseases and transfer this to another plant to make it more hardy. This can be faster than selective breeding and enable transfer across different species.

APPLICATIONS

Genetic markers allow scientists to identify plants with beneficial genes that will make the plants hardier or improve yields. They can also check whether the plant has genes farmers wouldn't want to replicate, e.g. that makes the plant more vulnerable to drought. This makes the process of selective breeding much faster.

Genetic modification is a technique that can be used in plant breeding. It allows scientists to introduce genes and characteristics that could not be introduced by selective breeding, or to increase the efficiency and/or speed of the plant breeding process, which can be very slow. An example would be introducing genes that allows beans to take nitrogen from the air into wheat plants so that they require less fertiliser

Whilst on the one hand some farmers and scientists argue that GM crops will require less fertilisers and pesticides, some environmental groups are worried about possible unforeseen consequences. Others are concerned about whether there are any health risks, although all GM crops are subject to an environmental and food safety assessment which is based on whether they are equivalent to a non-GM counterpart before they can be used in food or animal feed.

Case Study: Nitrogen Fixation in Wheat

Research is looking into the possibility of using genetic modification to produce wheat that uses bacteria to take up nitrogen – a process only currently found in legumes (e.g. beans and lentils).

Increasing a plant's access to Nitrogen leads to a healthier, more successful specimen, thus improving yield.

At present, Nitrogen fertilisers are used to address this. However, these fertilisers are expensive, harmful to the environment and their production and use has a high carbon footprint (i.e. produces a lot of carbon)

If the research is successful, farmers would not need to use as much fertiliser, reducing cost and the environmental impact of growing wheat.



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Precision agriculture – WheatScan

Precision agriculture uses modern technologies like GPS (used in the sat nav in your car or the map on your phone) to ensure that farmers apply fertiliser and pesticides where they are needed.



- WheatScan allows farmers to create a detailed map of their fields to work out exactly where plants need more water, fertiliser or pesticides.
- Using infrared images from drone planes flying over the fields, farmers can tell whether patches of the field are unhealthy or the soil is too dry.
- These maps are shared with tractors and farm machinery fitted with GPS. The machinery can then spray fertiliser, pesticides or water exactly where it is needed, rather than spraying the whole field in one go.



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Biological Controls – Case Study

Use of the staphylinid beetle A. Coriaria for Biological control of Wheat Bulb Fly

- Wheat Bulb Fly is one of the more prevalent threats to wheat production in Britain during winter
- At present we rely on pesticides to manage this problem, which can cause environmental damage and water pollution.
- Introducing a predatory beetle (called A. Coriaria), native to the UK could be used to control the Wheat Bulb Fly population.
- The beetle which can be reared easily by growers predated on the wheat fly and it's eggs.
- Through this method, growers could be able to target the problematic pest directly, reducing their dependence on pesticides and without introducing an invasive species



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Biological Control – Case Study

Lure and Kill Technology to reduce Beetle Pests

- Work funded by Innovate UK and The Biotechnology and Biological Research Council is in the process of developing a system that is capable of targeting Beetle pest populations directly without the need for blanket pesticide spraying.
- The 'Lure and Kill' technology attracts beetles to simple devices, through attractive odours and pheromones*. The device then coats the beetle with spores of a fungal disease.
- The disease, which is naturally occurring in the UK, spreads amongst the beetle population
- The spores are electro-statically charged and therefore stick to the beetles body and spread easily through the beetle population.

* Chemicals that animals release to attract other animals or signal to them e.g. when they mark their territory

Source: <http://www.rothamsted.ac.uk/news/new-collaborative-research-project-gets-under-way-fight-beetle-pests-pulse-crops-innovative>



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Product redesign



Longer shelf life – using microwave techniques, bread can be treated so that all the spores that produce mould are killed off. This would mean bread lasts for up to 60 days, reducing waste in supermarkets and at home.



Different flours – pulses like chickpea can also be used to make bread. As a crop, they need about half the fertiliser of wheat. Pulses also extract nitrogen from the air and replenish it in the soil – making them excellent for crop rotation. They give bread a different texture and are better used for flatbreads.



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Reducing waste through irradiation



Irradiated food must carry this label

Irradiation uses low levels of gamma rays to kill off bacteria and slow decay, it sterilises food and can kill off insects. This can mean that food has a longer shelf life and carries fewer germs that can lead to food poisoning.

Wheat and wheat flour is irradiated in the US to control insects.

It can currently be used in the UK on cereals (including wheat) as well as potatoes, vegetables, cereals, Fish / shellfish, poultry and herbs and spices, but it must carry this symbol



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17. Action Plan: Instructions

What to do:

- **Start by thinking about what are the most important challenges you think need to be addressed**
 - look back at the challenges board and flipcharts to remind yourself
- **Then decide what solutions can be applied to address each challenge,**
 - look back at the solutions boards and the red, amber and green flipcharts you did for beef, wheat and chicken
- **Then you need to write up what you think food caterers, retailers, manufacturers, farmers, government, consumers need to do**
 - Look back at your workbooks

Challenges Board



18. Action Plan: Task

Action Plan!

How do you think the UK food system should move forward?

Taking into consideration...

- the **challenges** which are facing it
- the **priorities you have as consumers** when buying food
- And the different **solutions** we've discussed...

What are the main *challenges* you think should be prioritised?

What are *solutions* that should and shouldn't be prioritised? Why? Should we stagger solutions or do them all at once?

Who in the food system should be doing *what*?

These are the pressing **challenges** we want to address

These are solutions which we're happy to go forward with...

Challenges	Solutions to apply, because...

There are some solutions that **have potential** to address these challenges, **but with caveats (if...)**

and others we think **should not** be applied **unless** there are certain guarantees or safeguards in place

Solutions to apply, if...	Solutions not to apply, unless...

These are the pressing **challenges** we want to address

These are solutions which we're happy to go forward with...

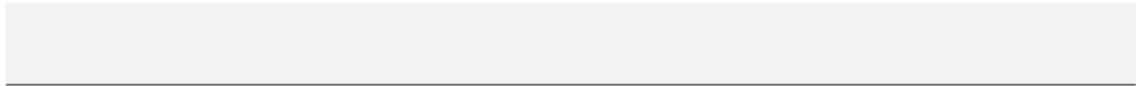
Challenges	Solutions to apply, because...

There are some solutions that **have potential** to address these challenges, **but with caveats (if...)**

and others we think **should not** be applied **unless** there are certain guarantees or safeguards in place

Solutions to apply, if...	Solutions not to apply, unless...

We want food *caterers* to...



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We want food *retailers* to...



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We want food *manufacturers* to...



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8

We want *farmers* to...



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9

We want *government* to...



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10

We want *consumers* to...



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11

19. Action Plan: Solutions Board

New Processes & Manufacturing Methods

Using microwave technology to keep bread fresh for up to 60 days




Rapid surface chilling



Chlorine wash

Lactic Acid wash



Using irradiation to slow decay of wheat

Freshness labelling – to show accurately when food is off



Portion packs



Irradiation to kill of germs

Roast in the bag chicken – to stop germs spreading



New Products

Bread made from **chickpea flour** to reduce the amount of wheat needed




Eating **insects** as a more sustainable source of protein for us

Food made from mechanically separated meat



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Behavioural

Eating less meat, having meat free days




Eating different cuts of meat – to reduce waste



Labelling embedded water and carbon footprint to help people make better choices





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New Farming Methods



Precision agriculture – using modern technologies like GPS to target fertilisers and pesticides where they're most needed

Biological controls – using predatory insects to kill pests



Insects as animal feed



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Biotechnology

Enhanced selective breeding – using Genetic markers or genetically modified wheat to reduce Need for fertilisers



Embryo transfer – using IVF to take eggs from high quality cows, Fertilise (using artificial insemination) these in a lab and implant these into other cows



Lab produced meat as a more sustainable source of protein

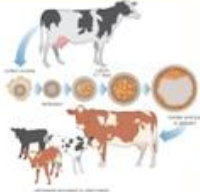


Feeding chickens GM soya



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Cloning cattle to introduce genetic copies of animals With desirable characteristics To introduce these to other herds



20. Biographies of video contributors



Prof. Tim Benton
'Champion' for the UK's Global Food Security programme

The Global Food Security programme is a partnership of the UK's main public funders of research in food security, including the Research Councils and UK Government departments, including the Department for Environment, Food and Rural Affairs (Defra), Department for International Development (DfID) and the Food Standards Agency (FSA), as well as the Scottish Government and Welsh Assembly Government. The role of the Global Food Security programme is to ensure that strategically important research is undertaken in related sciences, and to add value to research using interdisciplinary collaboration, alignment and engagement with communities of stakeholders.

The role of the Champion is to act as a leader, coordinator and facilitator of the programme and to act as an ambassador both for the programme and the area, facilitating knowledge exchange between research and stakeholders in government, industry and society.

Tim is also a leading researcher, based at the University of Leeds, on agri-environment interactions and finding ways to make agricultural production more sustainable.



Dr Andrea Graham
Head of Policy, National Farming Union of England and Wales (NFU)

The NFU objectives are to champion farming in England and Wales and to provide professional representation and service to Farmer & Grower members. They have 55,000 members across England and Wales.

Before working for the NFU Andrea worked for 18 years in agricultural research. She has been involved in developing national policy and advice for the NFU on many key countryside issues including agri-environment schemes, wildlife and biodiversity, landscape, forestry and woodland, and the design and implementation of the Campaign for the Farmed Environment. Before her position as Head of Policy she was NFU's Chief Land Management Adviser, taking a policy lead on knowledge exchange and the application of science and innovation on farms, sustainable intensification, and the Green Food Project.



Prof. Guy Poppy
Chief Scientific Advisor at the Food Standards Agency

The Food Standards Agency (FSA) is responsible for food safety and food hygiene across the UK. It works with local authorities to enforce food safety regulations and its staff work in UK meat plants to check the standards are being met. The FSA also has responsibility for labelling policy in Scotland, Wales and Northern Ireland, and for nutrition policy

in Scotland and Northern Ireland. Responsibility for nutrition policy in Wales lies with the Welsh Government.

The Chief Scientific Adviser (CSA) is responsible for:

- the integrity of the processes used to source scientific evidence and ensure expert scientific advice is available to the agency.
- representing the agency in the community of departmental Chief Scientific Advisers and the wider scientific community
- championing science within the agency through developing its scientists' expertise

The CSA has overall responsibility for all of the analytical disciplines from which the agency draws advice: natural and physical sciences, social science, economics, operational research and statistics.

Guy is also Professor of Ecology at the University of Southampton.



Judith Batchelar
Director of Brand at Sainsbury's

Judith Batchelar has worked in the food and drink industry for thirty years, and is a biochemist and registered nutritionist.

She has been director of Sainsbury's brand for nine years, and is responsible for all aspects of Sainsbury's product offer – from policy formation on areas such as animal welfare, ethical and sustainable sourcing, through to product technology, product development, product safety, and packaging. In essence, her role is to drive the quality and innovation agendas, and protect and enhance the reputation of Sainsbury's brand.

In addition to her work at Sainsbury's Judith sits on the Leadership Council for the Agri-Tech Strategy (the government's strategy for agricultural technologies), is on the Board of Trustees for The Marine Stewardship Council, Farm Africa and GroceryAid. She is a member of the Institute of Food Science and Technology (IFST), a fellow of the Royal Society of Arts, and an ambassador for the Woodland Trust. She also sits on the Executive Board of The Prince's Trust Accounting for Sustainability Project.

Sainsbury's has roughly the same market share as Asda (Tesco has the most).



Andrew Kuyk
Director of Sustainability and Competitiveness, Food and Drink Federation (FDF)

The Food and Drink Federation is the voice of the UK food and drink industry, the largest manufacturing sector in the country. Manufacturers that the FDF represent include Cadburys, Coca-Cola, Rachel's Organic, Dorset Cereals, Birds Eye.

Their aim is to help their members operate in an appropriately regulated marketplace to maximise their competitiveness. They communicate their industry's values and

concerns to Government, regulators, consumers and the media. They also work in partnership with key players in the food chain to ensure our food is safe and that consumers can have trust in it.

Andrew's is responsible for directing the resource efficiency programme for food manufacturing sector and leading the FDF aim of putting sustainable food production at the heart of Government economic policy in order to meet the twin challenges of food security and climate change.

Andrew was awarded CBE in Birthday Honours List in 2006 for services to the Department for Environment, Food and Rural Affairs (Defra)



Dr. Tom MacMillan
Director of Innovation, Soil Association

The Soil Association is a charity campaigning for healthy, humane and sustainable food, farming and land use.

Dr Tom MacMillan is responsible for supporting continuous improvement in organic systems and helping organic and non-organic farmers share best practice.

He manages the Duchy Originals Future Farming Programme, which supports sustainable innovation by UK farmers and growers, in partnership with the Organic Research Centre, Waitrose and the Prince of Wales' Charitable Foundation.

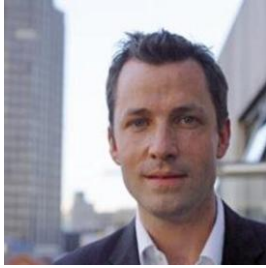
Previously Tom was Executive Director of the Food Ethics Council. He has been a member of the expert advisory panel for the Cabinet Office Strategy Unit's Food Matters report, a member of the BBSRC Science and Society Strategy Panel, a trustee of Sustain and a director of the Brighton & Hove Food Partnership.



Prof. Charles Godfray
Director of Oxford Martin Programme on the Future of Food,
University of Oxford

Prof. Charles Godfray works to bring together research on any aspect of food throughout the University of Oxford. He chaired the Lead Expert Group for the Department of Business, Innovation and Skill's Foresight project on Global Food and Farming Futures which reported in 2011. In 2011-12 he was a member of the High Level Panel of Experts Project Team on Climate Change and Food Security set up by the UN's Committee on World Food Security.

He is also a member of the Strategy Advisory Board for UK Global Food Security Programme, the International Advisory Board of the Sustainable Consumption Institute at the University of Manchester, chair of the Duchy Originals Future Farming Programme Steering Group and a member of the Steering Group of the UK Government's Green Food Project.



Dan Crossley
Executive Director, Food Ethics Council

The Food Ethics Council is a charity that provides independent advice on the ethics of food and farming. Their aim is to create a food system that is fair and healthy for people, animals and the environment.

Dan's previous role was Principal Sustainability Advisor and Acting Head of Food at Forum for the Future, where he worked for six years and advised many of the world's leading food business on sustainability. He led flagship food projects, including Consumer Futures – which explored how to create consumer pull on sustainable food – and Check-out Carbon, which explored the role of carbon labelling in creating a low-carbon shopping basket.

Dan has also advised Government, for example in his roles on Defra's Green Claims Steering Group and Green Food Project. He was a member of the Carbon Trust Reduction and Communications Steering Group, which developed the Code of Good Practice for product greenhouse gas emissions and reduction claims in the UK.

Dr. Robert Bradburne
Head of Farming and Biodiversity Science, Department for Environment, Food and Rural Affairs

Defra are responsible for policy and regulations on:

- the natural environment, biodiversity, plants and animals
- sustainable development and the green economy
- food, farming and fisheries
- animal health and welfare
- environmental protection and pollution control
- rural communities and issues

Priorities include leading the world in food and farming, and improving the environment.