

Food Standards Agency – Consumer understanding of food risk: chemicals

Topline report

TNS BMRB Research

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Summary findings

- The findings in this report are drawn from four qualitative Citizens Forums and an online survey of 2,708 consumers on the FSA Consumer Panel.
- Participants' overall level of knowledge about chemicals in food was limited. Two-thirds of participants in the survey (66%) stated that they were not well informed on the topic. In the qualitative Citizens' Forums, participants' conception of chemicals in food was mostly focussed on man-made chemicals deliberately added by producers (such as sweeteners and preservatives) – there was almost no spontaneous suggestion of the existence of naturally produced chemicals.
- When presented with the 5 different categories of chemicals (chemicals deliberately added to food; chemicals naturally present in food; chemicals present in food as residues of food production; chemicals present in food as residues of veterinary medicines; chemicals present in food as a result of human contamination) shown in stimulus material during Citizens' Forums, these initial participant assumptions about chemicals in food were challenged. As more detail was given about the chemicals that were deliberately added to food by producers, concern about this category decreased. Deliberately added chemicals came to be accepted as an 'inevitable' aspect of modern food production, that were not without benefits.
- Conversely, learning about the presence of naturally produced chemicals in food (including potentially harmful ones such as plant toxins and arsenic) led to feelings of concern and a heightened sense of risk. These chemicals were seen to be unfamiliar and unknown – and participants worried that it might not be possible to regulate or control the presence of these chemicals in food.
- After the Citizens' Forums were completed, the list of 5 categories was reduced to 3 categories (chemicals deliberately added to food; unintentionally/unavoidably present man-made chemicals; and unintentionally/unavoidably present naturally occurring chemicals) that were tested using the FSA Consumer Panel. These combined categories were used in the quantitative research order to reflect the fact that these were the categories that produced the strongest and most divergent reactions from consumers in Citizens' Forums.
- Participants lacked specific knowledge about the risks associated with chemicals present in food. In the survey, poisoning and gastrointestinal problems were most commonly selected as potential health risks associated with chemicals; over half of participants (53%) selected these respectively. In the Citizens' Forums, perceptions of risk were equally uncertain – with views also tending to shift based on available information. Being provided with information about previously unknown types of chemicals tended to elevate perceptions of risk.
- Despite lacking knowledge of precisely who was responsible for regulating chemicals in food, participants in the Citizens' Forums held an underlying belief that 'someone' was responsible for ensuring consumer safety. This assumption provided reassurance that any chemicals added to food deliberately, and any chemicals used in production processes, would be closely monitored and safe for human consumption. At the same time, there were concerns that regulators might be unable to keep up with the pace

of change with developments in food technology, and that the long-term effects of some chemicals might still be unknown.

- Participants gave mixed responses about the amount of further information they would like to receive. It was felt that too much information about chemicals that are present in food would risk overwhelming consumers, and participants were uncomfortable with learning about chemicals that they felt they could do little to avoid. Participants were much more supportive of the idea of communicating risks to the public when (a) the risks were particularly salient or dangerous, or (b) there were clear actions consumers could take to avoid or reduce risk.

1. Objectives and methodology

1.1 Research aims and objectives

The overall aim of this research was to explore consumer awareness, understanding, and perceived risks associated with chemicals in food and how best to communicate the risks attached to these. The specific research objectives were to explore:

1. What consumers know about chemicals in foods, in terms of both their natural presence in and their addition to foods – and to explore whether or not this distinction was understood by participants;
2. What they perceive as the risks associated with chemicals in food, within the context of other food risks ;
3. Whether consumers respond to different kinds of chemicals in different ways (e.g. pesticide residues; additives, flavourings, veterinary medicines residues, chemical contaminants such as lead and arsenic, fungal toxins, acrylamide, etc.);
4. Whether certain consumer groups – e.g., younger/older, by gender, or location - respond to ideas of chemicals in different ways; and
5. Consumer confidence in relation to the controls of chemicals in food.

1.2 Methodology overview

- TNS BMRB undertook a two-phase, mixed-method approach to this research, comprising qualitative Citizens' Forums followed by an online survey of 2,708 via the FSA's Consumer Panel.
- Four Citizens' Forums were conducted in total across England, Wales and Northern Ireland, involving a total of 39 participants. Forum research was conducted between 8th and 12th June 2015. Sessions lasted around 90 minutes. The sample was designed to reflect the spread of the local population in each of the research areas in terms of gender, rural/urban locations, and socio-demographics.
- The quantitative element of the research consisted of a 10-minute online self-completion survey, conducted with 2,708 members of the FSA Consumer Panel. The FSA Consumer Panel is operated by TNS BMRB and is comprised of a subset of the Lightspeed GMI panel, which consists of members of the general public, aged 16+ and living in the UK.

The report is divided into the following sections:

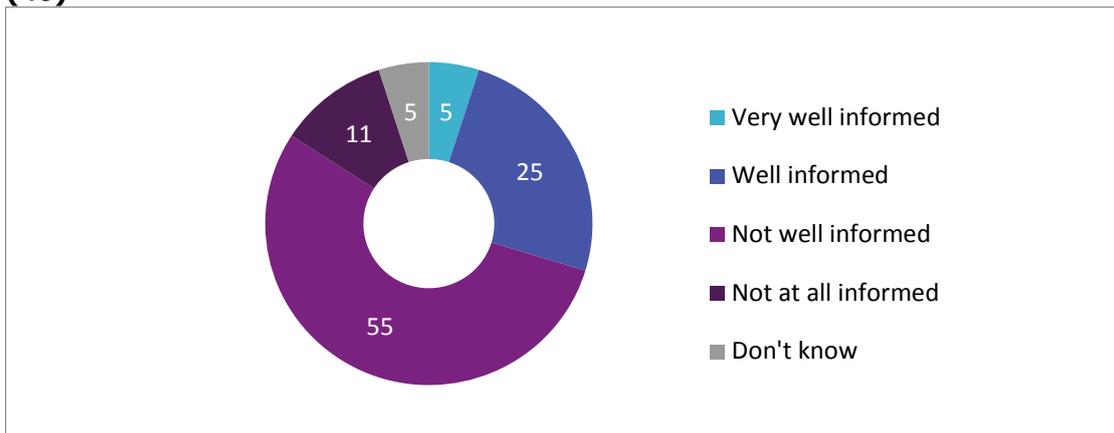
- Section 2. Consumer awareness of chemicals in food
- Section 3. Comparison of different categories of chemicals
- Section 4. Perceptions of risk relating to chemicals in food
- Section 5. Consumer confidence in control of chemicals in food

2. Consumer awareness of chemicals in food

2.1 Current levels of awareness

- Participants in the Citizens' Forums acknowledged that they had very low spontaneous knowledge about the topic of chemicals in food. This was reflected by the two thirds (66%) of participants in the quantitative survey who stated that they felt either 'not at all informed' (11%) or 'not well informed' (55%) about chemicals in food. Less than a third of participants (30%) stated that they were 'well informed' or 'very well informed'.

Figure 2.1: How well informed respondents feel about chemicals in food (%)



Source: Risk, Rare Burgers and Chemicals Survey Q17. How well informed do you feel about chemicals in food?

Base: All respondents (2,708)

- Participants' spontaneous, unprompted understanding of chemicals in food was limited to chemicals added to food as part of production. More confident participants in Citizens' Forums were able to name specific chemicals such as emulsifiers, 'e-numbers', and MSG. However most participants' knowledge was framed broadly, identifying chemicals under general categories such as 'food additives', pesticides, fertilizers, preservatives, and colourings.
- Some groups felt slightly more confident about their knowledge of chemicals. Younger respondents in the survey (aged between 16 and 24) were slightly more likely to say that they knew more about chemicals in food (38% felt either well informed or very well informed, compared with 30% of the population at large). Equally, survey respondents from within Social Economic Grade A¹ were also more

¹ Social grade classification in the survey was based on the occupation of the chief income earner in their household. Social grade A refers to those in Higher managerial, administrative or professional jobs.

likely to believe they were well informed or very well informed (38%), as were just under half (46%) of respondents living in London. The segmentation group *Perfect Patsy* were more likely to say they were informed² (56%), whereas *Convenience Charlies* were less likely to feel informed (13%).

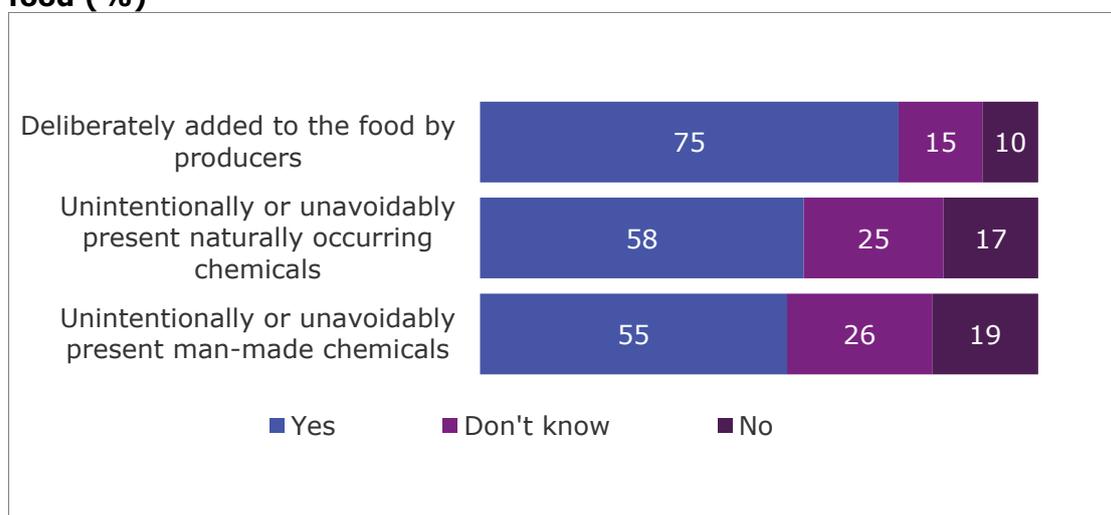
2.2 Awareness of natural vs. man-made chemicals

- There was very little spontaneous discussion or awareness of naturally occurring chemicals in food (e.g. fungal and plant toxins, arsenic) those chemicals which occur naturally in food, rather than as a result of human activity) among participants in Citizens' Forums. The term "chemicals" was strongly associated with man-made chemicals (e.g. polycyclic aromatic hydrocarbons (PAHs), acrylamide), and some participants initially assumed that by definition, any naturally produced substance found in food could not be described as a "chemical".

"[Chemicals] are not naturally produced. They aren't growing naturally. If we're talking about food, I'm expecting to be eating things that have grown." (London)

- When prompted with suggestions about potential sources of chemicals, participants in the quantitative survey were more likely to state that chemicals in food could have been deliberately added by producers (75%); they were less aware of chemicals that occur naturally (58%) or were produced by humans unintentionally (55%).

Figure 2.2: Respondent prompted awareness of sources of chemicals in food (%)



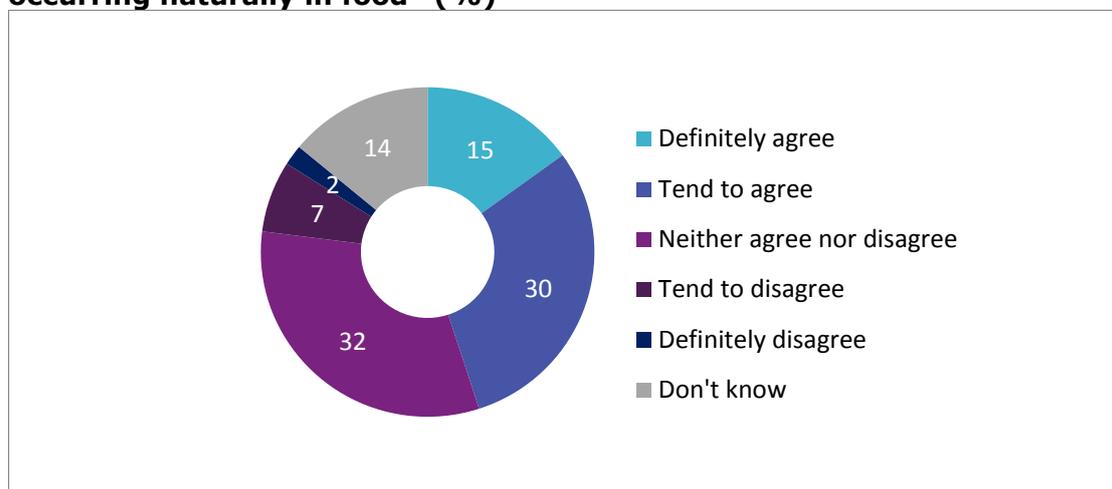
Source: *Risk, Rare Burgers and Chemicals Survey Q18. Where do you think chemicals in food could come from? Do you think they could be...*
 Base: All respondents (2,708)

- Once respondents had been prompted with the idea that chemicals might be present in food as a result of natural processes, these chemicals were assumed to be either uncommon or of low risk to consumers. Participants in the Forums initially believed

² Throughout the report responses have been grouped into net scores, for example, the response codes 'very well informed' and 'well informed' have been combined and are referred to here as 'informed' and those 'not well informed' and 'not at all informed' are referred to as 'not informed'. Net scores may not total the sum of the constituent categories displayed in charts due to rounding.

that 'natural' substances would be healthier and less dangerous than synthetic ones.³ Over four in ten (44%) participants agreed that man-made chemicals were more likely to be dangerous than chemicals occurring naturally in food, compared with only one in ten (10%) who disagreed.

Figure 2.3: Respondent agreement or disagreement with the statement "man-made chemicals in food are more dangerous than chemicals occurring naturally in food" (%)



Source: Risk, Rare Burgers and Chemicals Survey Q27. How much do you agree or disagree... - Man-made chemicals in food are more dangerous than chemicals occurring naturally in food
Base: All respondents (2,708)

3. Comparison of different categories of chemicals

3.1 Spontaneous categorisation of chemicals by consumers

- Participants in the Citizens' Forums did not spontaneously categorise chemicals based on their source or how they had been introduced into the food chain. Instead, participants in all four Citizens' Forums classified chemicals according to their purpose and the reason they would be added to food.
- Common categories that emerged spontaneously across the Forums were:
 - Chemicals added to increase shelf life/longevity of food
 - Chemicals added to change appearance/flavour of food
 - Chemicals used to control pests
 - Chemicals used to fertilize crops
 - Chemicals used on animals to treat illnesses/promote growth
- At this stage participants did not explicitly seek to distinguish between chemicals intended for consumption (e.g. sweeteners; preservatives) and those that were not (e.g. pesticides).

³ This reflects findings from recent TNS BMRB research on behalf of the Royal Society of Chemistry, which can be found online at www.rsc.li/pac

- Despite this initial focus on the purpose of chemicals added to food, participants accepted and understood the proposed alternative categorisation⁴ based on the source of chemicals, despite initial confusion regarding the existence of chemicals occurring naturally in food.

3.2 Reactions to FSA categorisation of chemicals in food

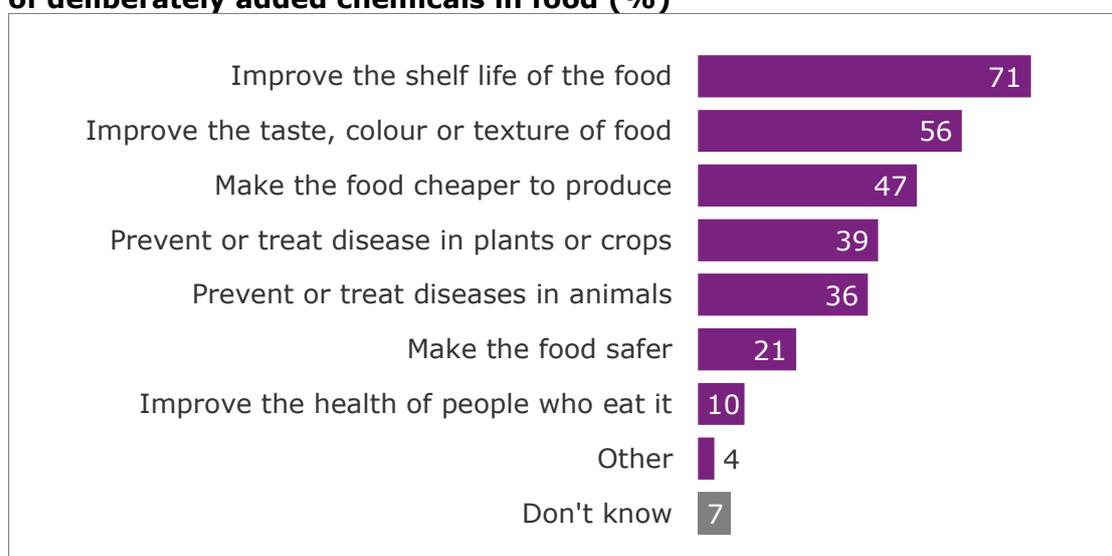
3.2.1 Perceptions of chemicals deliberately added to food

- Participants in both Citizens’ Forums and the online survey were most familiar with chemicals deliberately added to food. The most commonly selected reason for the inclusion of chemicals in food were to improve shelf life (71%) and to improve taste, texture and colour of food (56%).

“I need my fresh food to last 2 or 3 days because otherwise it would go in the bin and I cannot afford it. It makes sense why they use chemicals.” (Oldham)

- Levels of awareness of deliberately added chemicals correlated with age; 61% of those aged 16-24 considered them a source of chemicals in food, whereas this increased to 87% of those aged 65 and over. In line with this, older respondents were also more likely to be aware of specific reasons why chemicals would be deliberately added, with 9 in 10 respondents aged over 65 (88%) mentioning improvements of shelf life versus only half (52%) of those aged 16-24.

Figure 3.1: Respondent prompted awareness of reasons for the presence of deliberately added chemicals in food (%)



Source: Risk, Rare Burgers and Chemicals Survey Q19. Why do you think that chemicals would be deliberately added to food? Would this be to...

Base: All who think chemicals could be present in this way (2,493) Rebased over all respondents (2,708)

- Participants in Citizens’ Forums expressed some initial concerns regarding deliberately added chemicals in food. Participants who described themselves as being

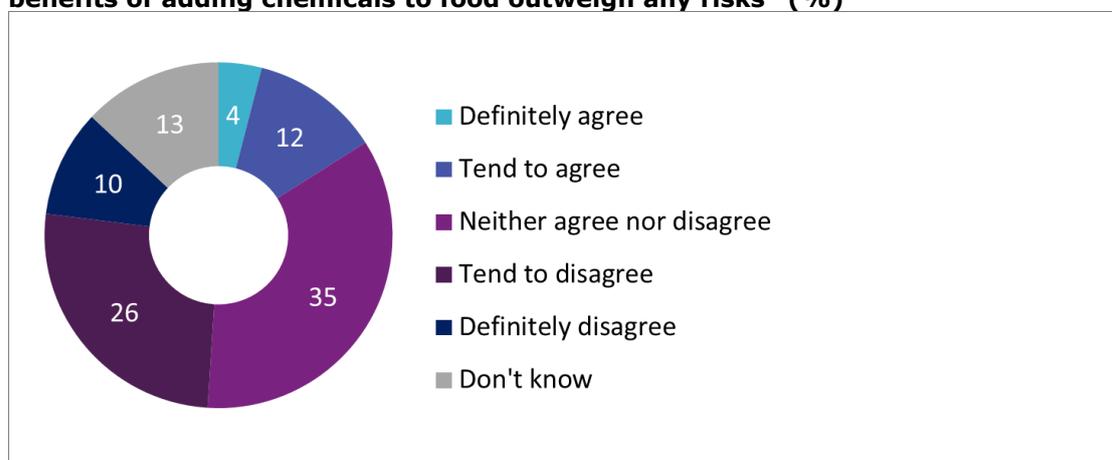
⁴ This categorisation divided chemicals between chemicals naturally present in food; man-made chemicals deliberately added to food (further sub-divided in Citizens’ Forums to include chemicals present as a residue of production processes; and chemicals present as a residue of veterinary medicines); and man-made chemicals unintentionally present in food.

more risk-conscious expressed worries about the potential impacts of 'additives' in food. For example, some made reference to news stories about food with high levels of E numbers leading to behavioural problems or hyperactivity in children. These concerns were driven by the view that food with a high additive content, or that had been heavily processed or modified, was likely to be less healthy and of lower quality than food that had been produced 'naturally'. This reflects other FSA research, where consumers consider additives and processed foods to be linked to diabetes and heart disease, and other longer term health issues.⁵

"It was the additives and chemicals in the food that was making my sister's kids go absolutely berserk." (Cardiff)

- Despite these initial concerns, further discussion about these chemicals led some participants in the Citizens' Forums to consider the potential benefits of additives. Participants recognised that the addition of these chemicals meant that foods had a longer shelf-life, and made meals look and taste better. It was also acknowledged that processed foods were more affordable than organic/natural foods. As participants discussed these benefits in greater depth, some came to believe that the benefits outweighed any associated risks. This was a change from participants' initial, unprompted beliefs: in the quantitative survey only 16% of participants agreed that the benefits of adding chemicals to food outweighed any risks, compared with 36% who disagreed.

Figure 3.2: Respondent agreement or disagreement with the statement "The benefits of adding chemicals to food outweigh any risks" (%)



Source: Risk, Rare Burgers and Chemicals Survey: Q27. How much do you agree or disagree... - The benefits of adding chemicals to food outweigh any risks
Base: All respondents (2,708)

- After further discussion, chemicals deliberately added to food were recognised by some as an inevitable and unavoidable part of modern food production. It was seen to be unrealistic that consumers could eat food entirely free of chemicals without being highly selective or paying a significant premium.

⁵ Consumers associated these risks with both chemical additives, but also with high sugar and sweetener content in food. From FSA Strategy 2015-2020, TNS BMRB March 2014

"You can feed more people – food can travel larger distances and last longer... for people who can't grow their own food or catch their own food." (Belfast)

- This acknowledgement of the widespread use of chemicals in food led to an assumption that producers and regulators would ensure that the chemicals used in food were ultimately safe for consumption. Equally, it was expected that any producers or retailers whose food contained particularly unhealthy or dangerous chemicals would risk facing negative press stories and loss of custom.

3.2.2 Perceptions of chemicals in food present as a residue e.g. pesticides or biocides

- Participants in Citizens' Forums had low spontaneous awareness of chemicals as residues. As shown in Figure 3.1 above, survey respondents were less conscious of the presence of chemicals designed to prevent or treat disease in crops, with only 39% of participants selecting these as a reason for chemicals to be added to food.
- After being shown stimulus materials, participants in the Citizens' Forums expressed a range of concerns about the possible implications of these chemical residues. There was an assumption that chemicals present as residues were likely to be unsuitable for human consumption, and more likely to lead to negative, long term health impacts. In particular, where pesticides and chemical washes were designed to control and kill pests/insects or remove bacteria, this raised questions about the potential impact on humans.

"Pesticides are designed to kill insects and micro organisms and stuff. If they kill these simple organisms, why would we think they aren't dangerous for us?" (Belfast)

- As with deliberately added chemicals, further discussion led to the conclusion that these residues were an inevitable part of modern life, and that it would be too expensive to eat only organic food. Unlike with additives, however, this sense of resignation did not alleviate concerns about chemicals present as residues – especially in the case of residues from chemicals not designed for human consumption.

"I don't like the idea of knowing that these chemicals are there, but unless I'm going to eat all my food organically, I just have to accept that it's inevitable that some of them are going to be there." (London)

- Although the view persisted that these chemicals would have been tested and approved before they were used in food produced for the public, a fear remained that longer term impacts were still unknown. These fears were compounded by (a) participants' lack of familiarity with these chemicals, and (b) a belief that it would be hard to tell whether or not food contained any chemical residues. This was in

contrast to additives, which participants expected could be identified through product packaging and labelling.⁶

3.2.3 Perceptions of chemicals in food present as a residue of veterinary medicines

- As with sources of chemical residues, participants were less conscious of chemicals that might be introduced to food in order to prevent or treat diseases in animals, with only 36% of survey participants identifying this as a potential source of chemicals in food when prompted (shown in Figure 3.1 above).
- Despite not being top-of-mind, when prompted, participants in the Citizens' Forums were quick to identify some of the benefits of animals having been treated with veterinary medicines. It was assumed that these medicines would keep animals safe from diseases that might otherwise enter the food chain and cause harm to humans. A few participants also considered the possibility that chemicals such as steroids might be provided to animals in order to promote growth and maximise the efficiency of meat production.
- Even more so than with the agricultural/process residues discussed in the previous section, there was a strong belief that veterinary medicine residues would be closely monitored and controlled, and that only approved medicines and chemicals would be used on animals that were reared for consumption. Equally, it was assumed that animals that had been treated with unauthorised veterinary medicines would not be allowed to enter the food chain.

"I think it all comes back to trust. We trust the people who sell us meat and produce...what choice do we have really as Joe Public." (Belfast)

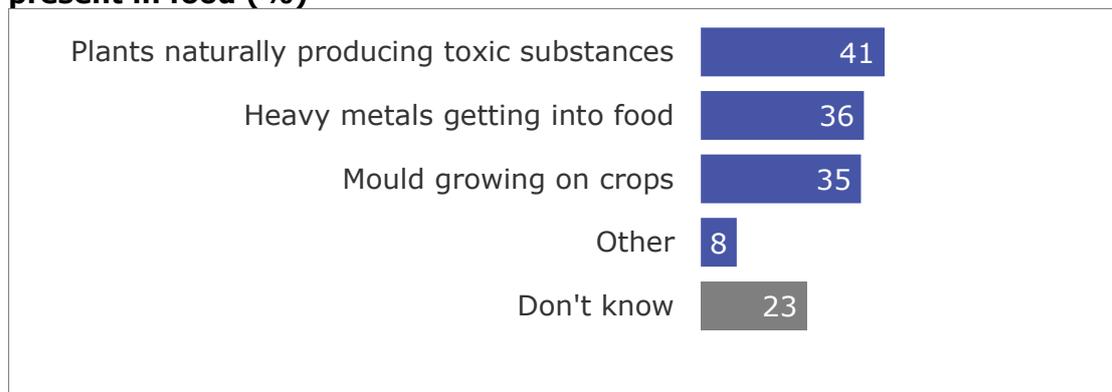
- One of the specific risks raised by a small number of participants was the possibility that antibiotics fed to animals might be consumed by humans in small doses. It was feared that this could lead to a rise in antibiotic resistance in humans.

3.2.4 Perceptions of chemicals naturally present in food

- Participants in Citizens' Forums were least familiar with chemicals naturally present in food. When prompted, respondents in the survey thought these chemicals were likely to be present via plants producing toxic substances, with four in ten (41%) participants stating this as a possible source. The trend of higher awareness amongst older participants was noticeable for this category also, with, for example, 42% of those aged 65+ being aware of heavy metals in food, compared with 23% of those aged 16-24.

⁶ This is concurrent with findings from the *FSA Food and You Survey Wave 2 2012*: 25% of consumers said they were very concerned about pesticides, compared with 21% for food additives. When asked what action they took as a result, 53% of those concerned about **pesticides** took no action and 21% said they read food labelling more carefully; whereas 45% of those concerned about **additives** read food labels more carefully, 39% took no action, and 19% stopped eating certain foods.

Figure 3.2: Respondent prompted awareness of reasons for the presence of chemicals occurring naturally in food unintentionally or unavoidably present in food (%)



Source: Risk, Rare Burgers and Chemicals Survey Q23. Do you think that chemicals occurring naturally in food could be unintentionally or unavoidably present in food in any of the following ways?

Base: All who think chemicals could be present in this way (2,246) Rebased over all respondents (2,708)

- The introduction of more detailed information (specifically about mould, plant and fungal toxins, and heavy metals such as arsenic) challenged initial assumptions and highlighted how little was known about chemicals that naturally occur in food. For example, the fact that arsenic could occur naturally in rice was particularly surprising to participants who had assumed that arsenic was a man-made poison.
- The 'cognitive dissonance' caused by the clash between the initial assumption that chemicals occurring naturally would be safer and the revelation that chemicals occurring naturally in food could have harmful effects meant that this category came to be seen as one of the least familiar and most potentially dangerous categories in the Citizens' Forums.

"I think that something natural is more frightening as you have no control – something manmade can be controlled." (Oldham)

- Concern was greatest, where participants felt that it would be difficult to detect or identify harmful chemicals in food. Therefore, chemicals occurring naturally in food that were expected to be 'invisible' (such as arsenic in rice) were more concerning than those that were expected – correctly or not – to be visible at point of consumption (such as fungal toxins or mould). This echoes concerns about chemical residues, where participants were more uneasy about chemicals they thought they would not be able to detect.
- Closely linked to this, discussion of the potentially harmful effects of chemicals occurring naturally in food raised questions about how possible it was for regulators and food producers to control these chemicals. Whilst it was assumed that deliberately added chemicals could be tested for safety before they entered the food chain, participants became concerned that it might not be possible to subject naturally occurring chemicals to the same kind of controls.

- Some participants in Citizens’ Forums living in more rural locations (more common in the groups in Cardiff and Belfast) were less concerned about chemicals occurring naturally in food, due to their greater familiarity with the kinds of chemicals that might occur naturally. Concern remained low even once these respondents had been prompted with detailed stimulus, believing that it would be necessary to consume these chemicals in very large amounts in order to experience any negative effects.

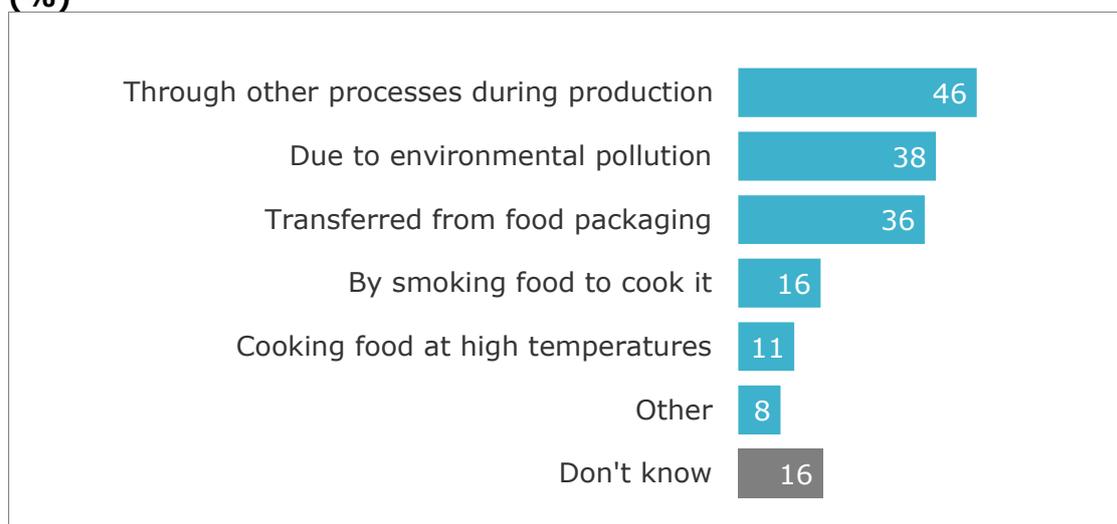
"I assume it's only in small quantities in the food we eat so I'm not worried about that at all." (Belfast)

- The quantitative research identified the segment *Convenience Charlie* as having the lowest awareness of chemicals occurring naturally in food, with less than half of this group (47%) thinking that they may be present. Of those who did know that chemicals might naturally occur in food, almost half (46%) said that they didn't know the source of these naturally occurring chemicals.

3.2.5 Perceptions of chemicals unintentionally present as a result of human activities

- As with chemicals occurring naturally in food, participants were less certain about how chemicals might be present in food as an unintentional result of human activity. Participants found this category difficult to understand, and found it easier to understand when placed in contrast to chemicals occurring naturally in food. When prompted with a list of ways in which chemicals might be unintentionally present, survey participants were most familiar with the idea that these chemicals could be formed during production processes – just under half (46%) recognised these processes as a potential source of chemicals.

Figure 3.3: Respondent prompted awareness of reasons for the presence of man-made chemicals unintentionally or unavoidably present in food (%)



Source: Risk, Rare Burgers and Chemicals Survey: Q21. Do you think that man-made chemicals could be unintentionally or unavoidably present in food in any of the following ways?

Base: All who think chemicals could be present in this way (2,181) Rebased over all respondents (2,708)

- In Citizens' Forums, participants were particularly surprised to learn about the harmful chemicals that could occur in food as a result of activity in the home (such as cooking food at high temperatures leading to the presence of acrylamide). This was reflected among participants in the quantitative survey, of whom only 11% of participants recognised cooking at high temperature as leading to the formation of chemicals, although awareness was notably higher amongst the *Perfect Patsy* segment (21%).

"If burning toast can cause these chemicals, what about smoked kippers and smoked cheese?!" (Oldham)

- The fact that consumers might introduce these chemicals themselves made the risks of this category seem more immediate. It also raised questions about the specific processes involved and what consumers could do to protect themselves.
- Participants in Citizens' Forums were particularly conscious of possible long-term health impacts of chemicals. Chemicals associated with industrial processes were specifically connected with the risk of cancer, and linked in to broader fears about the damage done by environmental pollution.

"Anything where the word 'cancer' jumps out to you, you've got to be worried." (Belfast)

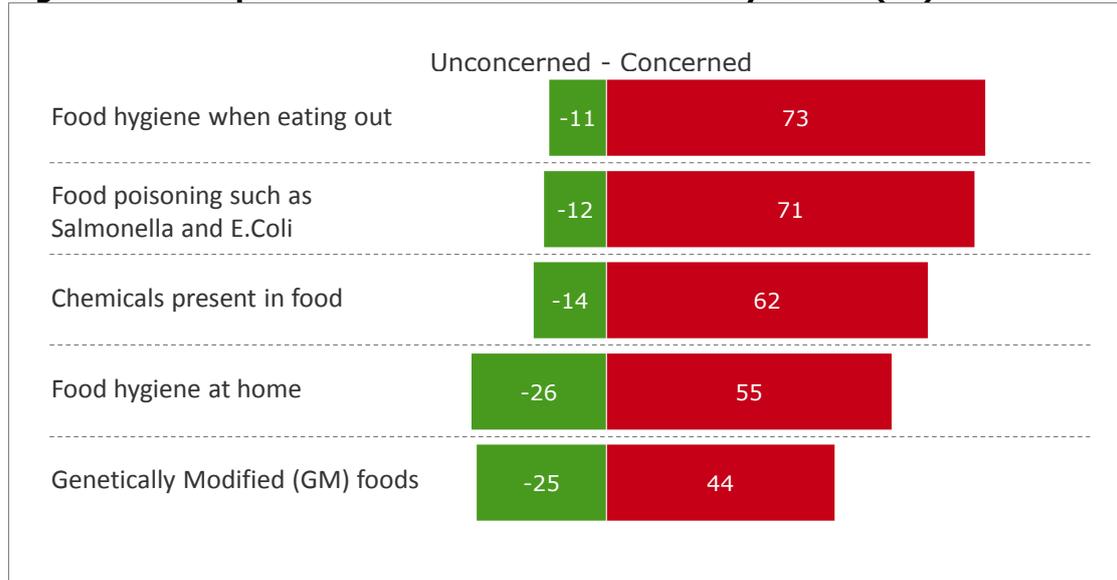
4. Perceptions of risk relating to chemicals in food

4.1 Perception of risk from chemicals in relation to other food risks

- When prompted to consider a range of different risks associated with food, the presence of chemicals in food was seen to be quite concerning, with just below two thirds (62%) of participants either fairly or very concerned about this. This was lower than the level of concern expressed about food poisoning and food hygiene standards outside of the home, but higher than concern about food hygiene within the home.⁷

⁷ This reflects previous FSA research about perceptions of food risk. Consumers expressed highest concern about food safety outside of the home (rather than in the home); and about the long term impacts of poor diet and chemical additives in food. *FSA: Balance of Risks & Responsibilities*, TNS BMRB July 2014

Figure 4.1: Respondent concern about food safety issues (%)

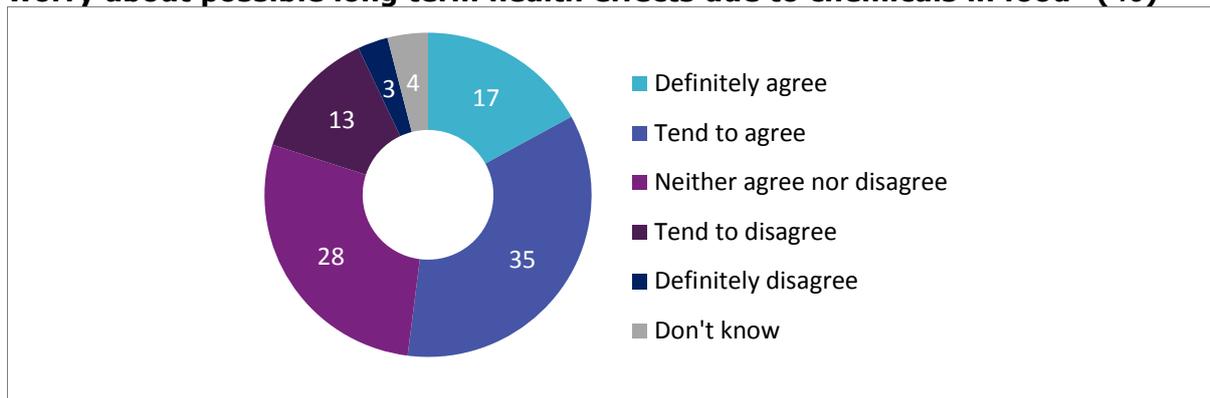


Source: Risk, Rare Burgers and Chemicals Survey: Q9. To what extent are you concerned or unconcerned by each of the following issues?

Base: All respondents (2,708)

- Reported concern about chemicals increased with age, with 75% of those aged 65 and over concerned, compared to 47% of those aged 16-24. Concern was also considerably higher amongst the segments *Perfect Patsy* (72% concerned) and *Meat-and-Two-Veg Reg* (77%), although it was lower for *Convenience Charlie* (44%) and *Feel-Good Frank* (50%).
- Just over half (52%) of participants in the survey stated that they were concerned about long-term health risks as a result of chemicals in food– compared with only 16% who disagreed.

Figure 4.2: Respondent agreement or disagreement with the statement “I worry about possible long term health effects due to chemicals in food” (%)



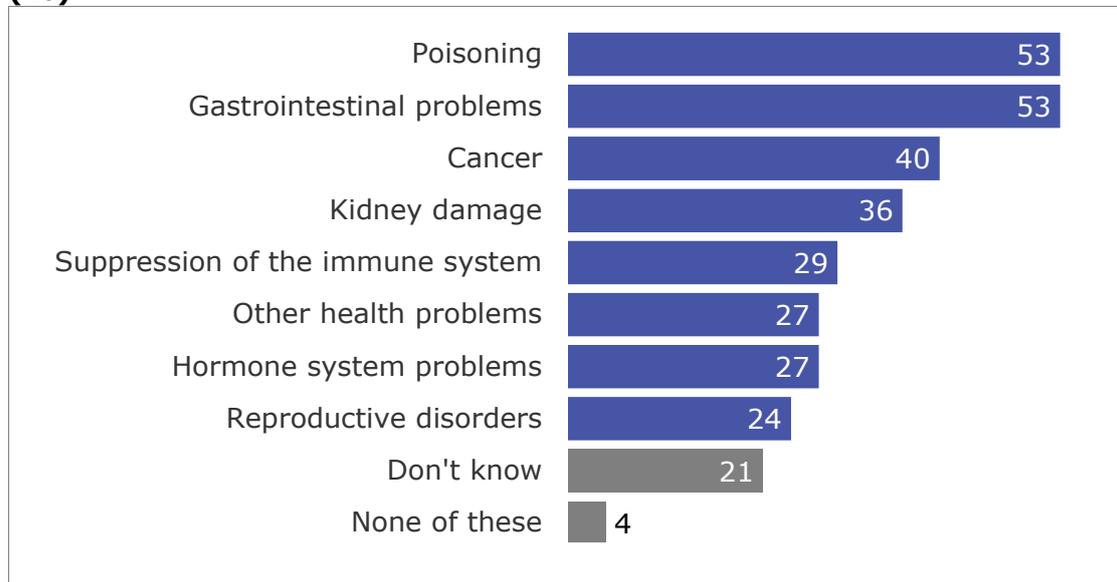
Source: Risk, Rare Burgers and Chemicals Survey: Q27. How much do you agree or disagree... - I worry about possible long term health effects due to chemicals in food

Base: All respondents (2,708)

- Despite these general concerns, specific knowledge about what the long-term health risks might be (i.e. which illnesses might be caused) was lacking. Prompted responses about specific risks were broad-ranging, which can be seen as an indication of participants’ uncertainty. Poisoning and gastro-intestinal problems were

the most commonly assumed consequences, with slightly over half (53%) of participants citing these as potential health problems caused by ingesting chemicals in food.

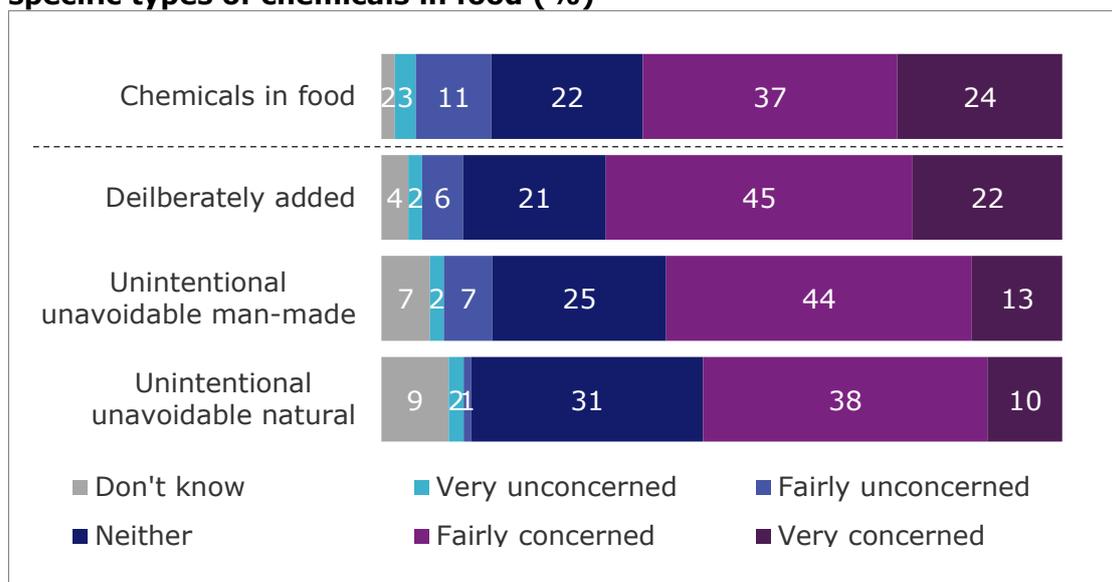
Figure 4.3: Proportion of respondents who think that specific health problems could occur due to eating chemicals present in food, prompted (%)



Source: Risk, Rare Burgers and Chemicals Survey: Q25. Do you think that any of the following health problems could occur due to eating chemicals present in food?
Base: All respondents (2,708)

- As knowledge of certain categories was limited, the way in which participants initially ranked different categories of chemicals in terms of risk was based on the information available: respondents appeared to attribute higher concern to those they were more aware of.

Figure 4.4: Proportion of participants concerned or unconcerned about specific types of chemicals in food (%)



Source: Risk, Rare Burgers and Chemicals Survey: Q9. To what extent are you concerned or unconcerned by each of the following issues?

Base: All respondents (2,708)

Q20/Q22/Q24. How concerned are you about chemicals deliberately added to food/unintentional or unavoidable man-made/chemicals occurring naturally in food in food

Base: All yes/don't know at Q18 for each (2,493/2,181/2,249)

- As participants in the Citizens' Forums were introduced to more information about the different categories of chemicals present in food their perceptions shifted. Chemicals that were unfamiliar and surprising (particularly chemicals occurring naturally in food, but also those chemicals that could be introduced by consumers) rose up the ranking of risk, while those which had clear benefits tended to reassure participants and fall further down the ranking.

5. Consumer confidence in control of chemicals in food

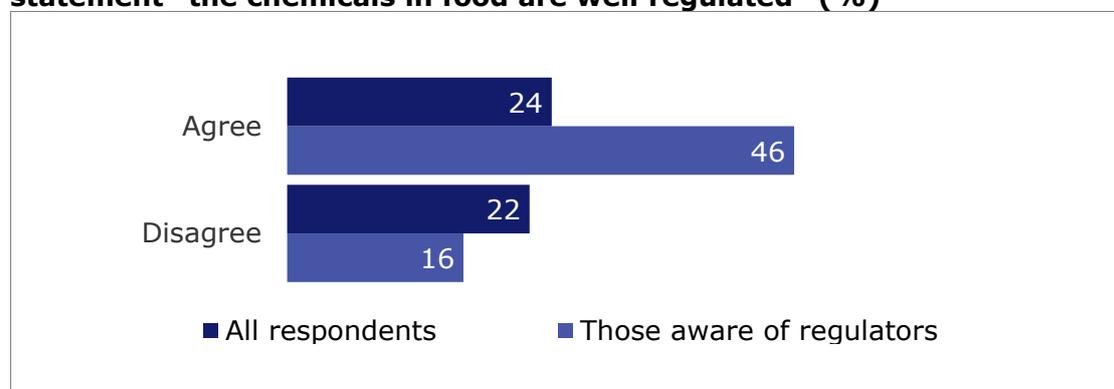
- Participants' concern about chemicals was closely linked with their confidence regarding the controls in place to protect consumers. Specific knowledge about the organisations responsible for controlling chemicals in food was low – only 18% of participants in the survey felt confident that they knew who was responsible, compared with 82% who did not.

"If [chemicals are] used worldwide, and approved by the World Food Organisation, what is there to be concerned about? If it was going to be harmful, they wouldn't be using it." (Cardiff)

- This uncertainty about how chemicals were regulated diminished respondents' overall confidence in the effectiveness of regulation to protect consumers. 46% of those who claimed they were 'confident' in their knowledge of the organisations responsible for regulation of chemicals in food in the UK believed that chemicals in food are well regulated, compared with 24% of those unaware of regulators.

- Men were more likely than women to both say that they knew who regulated chemicals in food (23% compared with 14%) and to feel that the chemicals in food are well regulated (29% compared with 19%).

Figure 5.1: Proportion of respondents who agree or disagree with the statement “the chemicals in food are well regulated” (%)



Source: *Risk, Rare Burgers and Chemicals Survey: Q27. How much do you agree or disagree... - The chemicals in food are well regulated*
 Base: All respondents (2,708)

- Despite a lack of detailed knowledge about how chemicals in food are regulated, respondents generally believed that ‘someone’ would be responsible for ensuring the safety of food. As indicated in the sections 3.2.1 and 3.2.2, upon considered reflection many participants felt that the widespread use of these chemicals was likely to mean that chemicals in food were tested and controlled either by retailers and food producers or by a regulatory body.

“I suppose we all sort of live in hope that someone is dealing with it so we don't have to think about it.” (Cardiff)

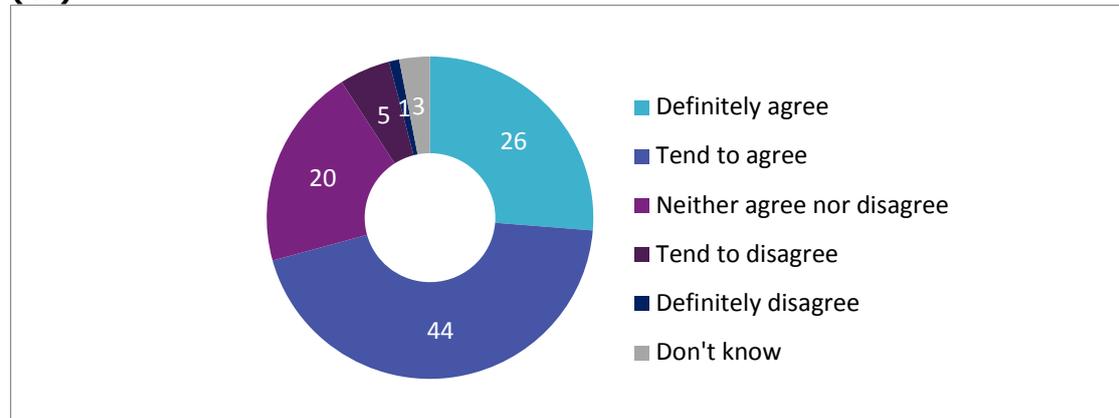
- Participants in Citizens’ Forums gave a wide range of suggestions about bodies that might be responsible for regulating chemicals in food – including the FSA, DEFRA, the European Commission, World Health Organisation, and farming organisations.
- A key concern regarding the quality of regulation was how well-equipped regulators were to adapt to scientific developments and keep abreast of new chemicals that might be added to foods. Some questioned whether or not it would be possible to tell what the long-term effects of new chemicals might be, and were uncertain of regulators’ power to mitigate unknown risks. This concern about long-term harm echoes previous FSA research findings⁸.

⁸ FSA: *Balance of Risks & Responsibilities*, TNS BMRB July 2014;
 FSA *Strategy 2015-2020*, TNS BMRB March 2014

6. Consumer preferences for communication about chemicals

- Participants acknowledged that their current level of knowledge in relation to chemicals in food was low. Over two thirds (70%) of participants agreed that they did not know enough about the chemicals present in their food.

Figure 6.1: Proportion of respondents who agree or disagree with the statement “I don’t know enough about the chemicals present in food” (%)



Source: Risk, Rare Burgers and Chemicals Survey: Q27. How much do you agree or disagree... – I don't know enough about the chemicals present in food
Base: All respondents (2,708)

- Despite recognising the sizable gaps in their knowledge of chemicals in food, participants in Citizens' Forums gave a mixed response when asked about what further information about chemicals they would like to have.
- On one hand, participants stated that they did not want to have to bear in mind a lot of detail about chemicals that might be present in food when making choices about food. Participants recognised how alarming they had found some of the detailed information that had been provided, and noted that they would prefer not to know about the existence of chemicals that they felt they could do little or nothing about.

"You can get information overload and I can't say we've really really really worried about it before." (Cardiff)

- It was also expected that providing too much detail about chemicals could be confusing for some consumers. Some participants expected that it would be difficult to devise a simple system for communicating risk associated with the concentration of chemicals in food, given the fact that some chemicals were perceived to have positive properties, e.g. preservatives.
- On the other hand, it was seen to be important to educate consumers about particularly salient risks that they could take action to avoid (for example if a particular farm was found to have produced contaminated crops that were of higher-than-average risk to the public). Equally, where consumer actions could introduce dangerous chemicals to food (for instance by cooking some food at high temperatures) it was felt that this information was important for the public to know, so they could avoid these behaviours in the future.

"Maybe the public needs to be informed about some of these, like the dangers of cooking at too high temperatures." (London)

6. Conclusions

Consumers worry about chemicals in their food and are not confident that they know enough about which chemicals are used, or how. Broadly, consumers think about chemicals present in food through the lens of food additives, and to a lesser extent pesticides. Some consumers perceived the presence of these types of chemicals in food as something that was unavoidable in a modern diet. Consumer concern is also somewhat assuaged by the assumption that chemicals in their food – at least any really dangerous ones – must be closely monitored and regulated.

Discovering new sources of chemicals in food was relatively alarming, particularly where these were perceived to be unintentional, difficult to control, and effectively 'invisible' to the consumer. Being presented with the idea of naturally occurring chemicals was thus the most disconcerting. We know from this and previous FSA research that consumer fears about chemicals are heightened by uncertainty, e.g. when longer-term risks are unknown. Concerns are also intensified when a new risk is revealed without provision of guidance about actions consumers can take to avoid the risk.

This research has revealed some of the challenges of communicating with consumers about chemicals in food. Consumer anxiety is likely to be intensified by any suggestion that either (a) chemical effects are not fully understood, or (b) that their presence is difficult to regulate. Consumers were unclear about how much they wanted to know, and felt overwhelmed by the notion of chemical information on packaging, expecting it to be overly complex or frightening. However, consumers supported the idea of receiving actionable information to protect themselves from risk, in terms of certain foods (e.g. certain moulds) or behaviours (e.g. burning food) that they could take steps to reasonably avoid.

Appendix – FSA Consumer Segmentation

Worried Wendy

Worried Wendy has a tendency to feel stressed or anxious. She's striving to do well in her career and compares her successes with those around her, sometimes struggling to switch off in her limited leisure time. Although she has time for food she isn't passionate about it, but her anxious disposition means she has a sensible approach to hygiene and food safety – particularly when it comes to avoiding food poisoning. Creative activities are her release and fast food or takeaways with a drink are a regular indulgence and are much preferred to eating out in restaurants.

Meat-and-two-veg Reg

Meat-and-two-veg Reg are set in their ways and save eating out for special occasions. They have plenty of free time and enjoy reading newspapers and magazines to engage their minds, as well as watching the news on TV to keep connected with the world. Food doesn't inspire them enough for them to spend their free time preparing or cooking it, so when they can they turn to partners or other family members for their meals. The food shop tends to be routine and revolves around brands they know and love for meals they eat regularly. They do care where their food comes from and will steer clear of unethical brands. Health is also important to Meat-and-two-veg Reg who are realising that as they get older they're no longer invincible.

Experimental Emma

Experimental Emma sees herself as something of an authority on food, and as such loves to cook for family and friends using fresh and exciting ingredients. She's relaxed in the kitchen because she's far more interested in the food than in safety and hygiene. For Experimental Emma there isn't much more to food safety than common sense, although she does absorb some useful information from her online and offline foodie magazines and sources of inspiration. She attains good health through a balanced lifestyle but she won't forsake taste or the best ingredients for health! She consumes a range of different media because she loves to be connected, especially on her tablet. Using on-demand and online services allows her to curate her own media schedule around her social life.

Feel-Good Frank

Feel-good Frank loves food and is prepared to pay to ensure that he has the most enjoyable experience. He's also not prepared to alter his behaviour if it will compromise the enjoyment of his food, as evidenced by his love for pink burgers!

On the occasions that he can find time to cook at home he likes to have the finest ingredients and tries to source these locally from independent shops and farmers markets. Normally though Feel-good Frank opts to eat out because it's easy and enjoyable. This focus on enjoying food, and the premium products and venues he eats in, means that Feel-good Frank doesn't think too much about hygiene. The good hygiene behaviours he has at home tend to result from a desire to be tidy rather than good intentions around food safety.

Overconfident Audrey

Overconfident Audrey is knowledgeable and experienced when it comes to cooking food, and food safety. She prides herself on having very high food safety standards that have become something of a second nature for her. However, her tendency to wash her hands, boards and raw ingredients regularly (which is largely a good habit!) means she incorrectly washes chicken. Overconfident Audrey cares about where her food comes from, as well as what's in it and this allows her to be confident about her health too. She regularly eats out at restaurants and cafés but unless she's verified that somewhere is clean she won't consider it. Food magazines and newspaper supplements are much loved by Overconfident Audrey, she makes the most of free food magazines in supermarkets but also buys her favourite magazines regularly and dedicates time to reading these. However, she distrusts adverts that look like articles, preferring to research things online that she's seen advertised in order to find out more.

Hard-Pressed Henry

Hard-pressed Henry is interested in food, and has the time and inclination to cook and prepare it. They have a strong idea of the food they would like to buy and how they would like to cook but struggle to afford it in reality. Despite this, they're doing the best they can and have a positive outlook on life as well as the ambition for things to be better. Although sensible with food hygiene and safety and keen to improve, the need to make food last longer is causing them to disregard use-by-dates and leave leftovers for longer. Hard-pressed Henry's preoccupation with price extends to media, they have a strong preference for free content and utilise the internet for this, happy to sit through advertising if it means they don't need to pay to access their media. They're connected on-the-go through their mobiles, regularly using them to access social networks, look up deals and shop online.

Perfect Patsy

Perfect Patsy has a busy professional and personal life which she's able to balance in order to cook from scratch regularly for family and friends. Food isn't so much a passion as an integrated part of her full life so she understands the value of cooking fresh food from scratch, and doesn't see this as being difficult. Being organised around the food shop and making considered purchases from a mixture of budget, premium, healthy and organic options helps her making cooking easy and affordable. She takes great care around food hygiene, adhering to almost all recommend practices because she would rather be safe than sorry. Perfect Patsy regularly eats out from a range of places and likes to try trendy new restaurants but nutrition and health are important to her, so she thinks about healthy options when choosing where to eat. She loves a trip to the cinema to relax and making time for her friends on and offline as she's confident with technology and adept at tapping into online content to suit her needs.

Convenience Charlie

Convenience Charlie just can't get excited about food, and as such resents spending time or money on cooking! They just want food to be quick and simple so tend to opt for ready meals and frozen foods. This means that they prepare very little from scratch which results in quite a low risk of getting food poisoning. When they do cook, their food safety knowledge and hygiene skills are pretty limited; they aren't aware of, and subsequently don't follow many of the recommended practices.

They rarely eat out formally, preferring the ease of takeaways and fast food, and deciding where to eat based on price rather than hygiene or cleanliness. As with food,

they're apathetic about their health and generally aren't particularly ambitious in life. Their media consumption is fairly average but they don't tend to notice newspaper ads whilst they do trust TV advertising.