Meeting

Update on Working Group 6 Food Safety and Net zero carbon (NZC)

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Paper by Claire Nicholson, Jonathan Wastling and Paul A. Nunn

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Summary

1. This paper outlines progress of the Working Group 6 review on Food Safety and Net Zero Carbon (NZC).

1.1 The Science Council is asked to:

- Note current progress (delivery of the interim report and targeted expert interviews)
- Discuss proposals for next steps to gather additional information for the final report.

Introduction

2. The UK set a legal target in June 2019 to achieve NZC emissions by 2050. The government recently set a new legally binding target to cut the country's greenhouse gas emissions by 78% by 2035 compared to 1990 levels.

2.1 This means any carbon emissions are balanced by schemes to offset an equivalent amount of greenhouse gases from the atmosphere, such as planting trees or using technology like carbon capture and storage. It does not include the carbon footprint of imported products. These are important qualifiers as it doesn’t mean an end to UK carbon emissions, or the carbon footprint driven by UK’s consumption of imported products.

2.2 At the 9th Science Council open meeting, the Council agreed in its closed session an initial work plan to deliver a review of the food safety implications of moving to net zero carbon; the Terms of reference were finalised on 27 October 2021.

Discussion

3. Phase 1 and 2 of the review is now complete, with last year's expert survey and workshop completed, written up and to be published as part of the interim report.

3.1 As previously stated, the survey took a wide view asking experts to identify all decarbonisation changes that might affect the food system. The workshop focused on changes that impact primary production (and primary processing) to provide a manageable scope (although inevitably discussion occasionally veered to other parts of the food system, and this was recorded)

3.2 The interim report was sent to the FSA Executive Management Team (EMT) on 9 June for discussion and feedback. It will then be published on Science Council website during Net Zero week (2-8 July 2022).

3.3 A summary of the themes that emerged from the activities discussed and current FSA activity in these areas can be found in Annex 1.

3.4 Some of the themes highlighted by the workshop were thought to need further investigation so four interviews were carried out over March 2022 with industry and academic experts focusing on aquaculture, livestock management, animal feed and farm management.

3.5 Claire Nicholson (WG6 chair), Jonathan Wastling (deputy WG6 chair) and Peter Gregory interviewed these experts and their insights will help inform the final report for this review.

3.6 To help identify possible gaps or areas of cross departmental interest and cooperation in the activities shown in the Annex, a small workshop with representatives of other HMG departments (Defra, GO-Science, BEIS, DFT and HSE) was held on 16 June 2022. Claire Nicholson will provide a short verbal readout of that workshop at the 11th Science Council open meeting.

3.7 The current planned next steps for Phase 3 will involve establishing the key questions that need to be answered around our understanding of the risks associated with these changes and look to agree a multifaceted evidence review

that suits each question.

3.8 **However, we would now like to open up discussion amongst members as to whether they agree with this approach and if they can suggest supplementary or alternative methods to deliver the final recommendations from the Science Council**.

Conclusions

4. Science Council members are invited to:

- **Note current progress (delivery of the interim report and targeted expert interviews)**
- **Discuss proposals for next steps to gather additional information for the final report.**

Annex: Table of main Net Zero Carbon (NZC) themes and issues/activities, FSA action in each theme and next steps

Theme	NZC Issues/Activities	Potential Risk(s)/Benefits	Existing information activity

Regenerative Farming

This is conservation and rehabilitation approach to food and farming systems. It is not a specific practice itself but uses a variety of sustainable agriculture techniques in combination.

Overall risks: Zoonoses (ZN), Foodborne disease (FBD)*, chemical contamination (CC), antimicrobial residue (AMR)

1. Mixed arable/livestock
2. Rewilding
3. Restoration of wetlands / peat lands to store carbon
4. Actions for soil health (poultry litter/manure, crop rot)
5. Reduced inputs (fertiliser and pesticides) and changing usage.
6. Reduced plastics – link to Food Contact materials work?
7. Anaerobic digestion

1. Foodborne disease (e.g. E.coli) in arable.(FBD)
2. Tuberculosis in cattle (increase/decrease?)(ZN), Bird Flu (ZN) & livestock eating wild plants.(CC)
3. Changes to water runoff.(CC, ZN, FBD)
4. Use of poultry litter/manure. (FBD, AMR), Biochar (CC), poor crop rotation management leading to mycotoxins (CC), livestock & crop rotations (FBD, CC), more legumes risk of spoilage in storage (CC).
5. Reduced runoff of nutrients and pesticides.
6. More prone to spoilage (FBD, CC)
7. Pathogens risk if it survives process? AMR in feedstock (FBD, AMR)

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New Technology Farming

This includes indoor agriculture (IA) and vertical farming -- is a technology-based approach toward food production taking place within an enclosed growing structure such as a greenhouse or plant factory to control growth conditions.

Overall risks:

Zoonoses, Foodborne Diseases, Chemical Contamination

1. Reuse of water?
2. How will systems age?
3. Less human contact with crop
4. Changes to nutritional profile of crops / plants grown in new systems?
5. Do new entrants / micro businesses require advice / support to avoid food safety issues?

1. On crops? (FBD & CC)
2. Where will there be risks of e.g. biofilms forming. (FBD)
3. Improved hygiene? Can automated systems spot disease potential as quickly? (FBD)
4. How will this change availability of nutrients for consumers?
5. New kind of agriculture which combines traditional farming and industrial design, how do the balance of risks differ from either one alone? (FBD, CC, AMR)

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Circular Agriculture

This looks to minimise inputs to food production, close nutrient loops and reduce negative discharges to the environment and valorise agri-food waste.

Overall Risks:

Zoonoses, Foodborne Diseases, Chemical Contamination

1. Recycling food waste: animal feed
2. Recycling food waste: composting

1. Who regulates? Can existing systems cope with an amplification of existing risks (botulism, swine fever, foot and mouth)?(FBD)
2. Who regulates? What are the new risks? Can existing systems cope with an amplification of existing risks? (FBD), Are recycled additions to compost (such as chitin as a soil conditioner) regulated under existing rule? (CC)

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Changing Livestock feed

For animals feed innovations are primarily aimed at reducing the carbon footprint of soy as a feed, but also there are initiatives aimed at using food waste and introducing supplements to reduce methane.

1. Replacement proteins (Soy replacement, food waste recycling, insect protein, etc?)
2. Supplements in animal feed, e.g. to reduce methane

1. Who regulates? Is the existing approvals process working?, Safety issues from the past: BSE, Swine fever, Foot & Mouth, Changed nutritional profile of meat from animals with new feeds / supplements?

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Overall Risks:

Chemical contamination

Aquaculture

Including active farming of fish and shellfish (salmon farms etc), fishing and harvesting of unfed sea/plants/animals that filter feed.

Overall Risks: Zoonoses, Foodborne Diseases, Radiation(RD), Chemical Contamination, Food Intolerance (FI)

1. Fish farming moving away from fishmeal and oil as protein and fat source (respectively) for feed (more source of omega-3).
2. Animal products/by products as a feed ingredient?
3. Cultivating Seaweed/molluscs/etc

1. Industry moved to plant protein concentrates, by-products of other processes. Fish meal is a potential source of salmonella, but this is managed through the feed production process and selection of suppliers.[FBD] Moving from fish meal and oil to other sources for feed reduces risk of heavy metal and POP contamination (CC).
2. Outside UK increasingly animal by-products used in feed. (ZN). Antibiotics may be used on land animals who go into feed, but risk reduced if a suitable withdrawal period is allowed before slaughter.(AMR)
3. Unfed aquaculture use static locations and feed on nutrients in water. Particularly prone to accumulate pollutants, if they are also in the water.[CC, RD] So location is very important.

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Labelling implications Overall Risks: Allergies	1. Novel Proteins in pre-packed foods. 2. Using product labelling to sell to the consumer as sustainable or green	1. If novel proteins cause allergies this should be labelled on the packaging. (AL) 2. If consumers use Green labelling to choose food products it should be accurate to not mislead	• Existing Alimen labellin standar allerge • Interna literatu review allerge labellin (FSA/FS • FSA is with De eco-lab give consist standar define sustain food. field (s above) what c expect they th sustain food. • Behavi impact Labelli eviden (compl • In Food 2 we as respon whethe check f informa the environ impact when s and if t

Changes to packaging

Reduced or changes to packaging and food contact materials are aimed at achieving net zero and also at achieving many sustainability objectives.

Overall risks:

1. Reduced traditional food packaging materials (e.g. plastic).
2. Changes to packaging materials and food contact materials (for example in pipes).

1. Reduced packaging may not fully protect food from cross contamination (microbiological, chemical and of allergens)(FBD, CC, AL).
2. Alternative food packaging materials may not be as inert or strong so may split and lead to spoilage (FBD, CC), also food contact materials made from allergenic natural sources could trigger food

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Gene Editing / Modification Overall Risks: Unknown	1. Of plants or animals for feed and food	1. Same as with any modified food or feed: is it safe to eat, is it susceptible to particular diseases etc. Also animal welfare questions.	• ACNFP any nov or nove before come t so this cover f human consum • The suc to ACA hopefu same f feed. • Defra p a consu on the of GE organis • FSA ha publish researc consum views o editing However do furth in this a testing commu around consum • Food a has had questio to mon consum awaren GM and so FSA track th time. T questio

Food Shortages Overall Risks: Nutrition, Allergy	1. Poor harvests or disruption due to climate change 2. New net zero methods turn out not to produce enough food	Both 1&2 could lead to: Increased food prices which may lead to Food Fraud (AL), Food Poverty(N). It may also be tempting in extreme cases to relax safety standards or quality standards.	• FSA tra on fooc shortag food ins in our c tracker Food ar survey looked part of Covid p of work includir in a Par • FSA are underta further analysi insecur • The Im Labour Shortag Consur Safety (comm by SIT) aims to the dow impact UK con specific conside food sa and foo availab Ends in '22. • In the W Consur Interes project measur consum

* Includes: Campylobacter, Listeria, Salmonella spp, C. botulinum, scrapie and E. coli