

ADVISORY COMMITTEE ON THE MICROBIOLOGICAL SAFETY OF FOOD**DISCUSSION PAPER****OUTCOMES FROM 25 JANUARY 2018 HORIZON SCANNING WORKSHOP****Issue**

The purpose of this paper is for the Committee to discuss the outcomes of the January 2018 horizon scanning workshop where members identified current and emerging microbiological issues of concern and rank the topics in terms of strategic priority and urgency. The Agency would also like to ask the committee whether it would be content to set up a sub group to consider a two dimensional approach in defining **risk assessment outputs considered by the committee**

Background

On 25 January 2018, the Committee held a horizon scanning workshop which preceded the plenary meeting that was held the following day. At the workshop the Food Standards Agency (FSA) gave two presentations: "Future of Food" provided by the FSA's Chief Scientific Adviser (Prof Guy Poppy) and Carlos Orri (FSA, Food Policy, Head of Food Additives, Flavourings and Contact Materials Branch) briefed the Committee on the Agency's preparations for the UK's exit from the European Union.

ACMSF Members had completed a questionnaire before the workshop which had asked the following questions (detailed response to questionnaire is at annex 1):

- Emerging issues that might present a risk to the public?
- Information that needs to be brought to the FSA's attention to help consumers make choices based on current evidence?
- Are there risk/opportunities associated with emerging technologies not already considered by ACMSF?
- Main issues, risks and opportunities following UK exit from the EU?
- Anything else to bring to the FSA's attention?

Following group discussions at the workshop, the Committee shortlisted the issues in the responses provided to the questionnaire they considered. The shortlisted topics are:

Emerging issues that might present a risk to the public

- **Emerging issues resulting from real changes in behaviour**
 - reduction in packaging and a move away from plastics

- Increased raw fruit and veg consumption and outbreaks associated with fresh fruit and veg and bagged salads
- Access to food via uncontrolled channels e.g. Internet shopping
- How populations/providers interact with the ageing population e.g. meals on wheels for the elderly produced in a pub
- Risks associated with increasing use of raw pet food

Information that needs to be brought to the FSA's attention to help consumers make choices based on current evidence?

- Many choice issues should be accommodated into the risky foods framework
- Redouble efforts to remove cross-government inconsistency in safety messages
- Redouble efforts to connect choices with science/evidence
- Joined up effort needed on areas of waste and food safety

Are there risk/opportunities associated with emerging technologies not already considered by ACMSF?

- New technologies introduce new interaction with existing risks
- Understanding the microbiological risks of new packaging
- *Sous vide* was viewed to still be a problem
- High Pressure Processing was viewed as an opportunity but may be increased or decreased risk depending on the application

Main issues, risks and opportunities following UK exit from the EU

- ACMSF support the FSA approach summarised in yesterday's presentation
- Possible changes in *modus operandi* for SACs including ACMSF in terms of resources and expertise and possible need to respond to an increasing number of fast paced issues
- Being out of the EU network "no UK voice of reason"
- Loss of technical expertise/skill base and EU National reference labs disappearing

Anything else to bring to the FSA's attention?

- Do ACMSF assessments have a life span e.g. non-proteolytic *C. botulinum* in chilled foods?
- Is it time to introduce a 2-dimensional framework for food risks? Set up a sub group to revisit how risk is assessed and expressed.
- Genomics risk assessment subgroup could be set up

FSA priority

The Agency's view is that it is particularly important to review approaches to microbiological risk assessment within the context of Internationally recognised frameworks. In 2012, the committee agreed an approach for qualitative estimation of risk as adopted by EFSA and numerous risk assessments have been presented to the committee using this approach. On occasions, some members have suggested introducing a 2-dimensional approach in expressing the outputs from these risk assessments by considering severity in addition to probability. Given that this suggestion was further reinforced at the horizon scanning workshop, the Agency considers it timely to set up a Committee subgroup to explore this issue further with a view to developing an approach to be incorporated into future risk assessments discussed by the committee.

Action

Members are invited to:

- Prioritise these shortlisted topics and the other responses (see annex 1) and indicate what topics they would like to include in the ACMSF work plan.
- Indicate whether they would be content to establish a sub group to consider a two -dimensional approach in defining risk assessment outputs considered by the committee where appropriate.

Secretariat

May 2018

ACMSF HORIZON SCANNING 2018

Based on your expert knowledge, and in the context of microbiological food safety:-
<ul style="list-style-type: none"> • Can you identify any emerging issues that might present a risk to the public?
<ol style="list-style-type: none"> 1. Possible increase in food poisoning as a result of increases in the import of microbiologically unsafe foods from non-EU countries after the implementation of Brexit. 2. Increase in the incidence of AMR infections as a result of 1 above. 3. Outbreaks related to salad leaves are getting more frequent. Identify/quantify risks posed by mixed bag salads. 4. Role of pet food (including raw meat) in outbreaks and ways to reduce risk to humans. 5. Women sending off their placentas for processing into capsules etc, and these being consumed by other family members. Similarly, the issue of breast milk being consumed by third parties, or women obtaining breast milk from other sources for their babies, and quantifying the risk associated with these activities. 6. There is an increasing awareness concerning an association between infection with a food borne pathogen and consequent inflammatory disease such as colitis, Crohns' etc. This connection could mean that risks associated with food pathogens are larger (and more complex) than currently assessed based on outcomes of acute infections. The expansion of detriment associated with food borne pathogens is an emergent issue and the scientific literature includes an increasing number of articles ("Acute Infectious Gastroenteritis Potentiates a Crohn's Disease pathobiont to fuel ongoing inflammation in the post infectious period" PLOS Pathogens 2016; "Recurrent infection progressively disables host protection against intestinal inflammation" Science 2017). Several recent risk assessments considered by the ACMSF have indicated a potential link between infection and Crohn's disease without strong evidence (e.g. "Review of latest research on possible link between MAP and Crohn's disease" from ACDP). Multi-objective detriment is an important emerging issue for QMRA. 7. Currently a process of 'disaggregation' impinges on the value of risk assessment associated with microbial hazards (and devalues some existing assessments). The increased ability to apply high resolution typing to pathogenic bacteria (without a corresponding increase in genotype-

phenotype identification) means that the number of identified hazards is increasing much faster than the number of completed risk assessments. Potentially the impact of traditional farm-to-fork risk assessments that identify specific agents, e.g. at a strain level, is reduced (Risks associated with anti-microbial resistant bacteria fall within this category as resistant bacteria form subsets of all the bacteria for a particular strain/species etc. – AMR is a strongly disaggregated hazard and so, currently, is poorly supported by quantitative risk assessment). In a small number of cases machine learning has been shown to assist with aggregation of risks and this may emerge as a new approach in risk assessment (e.g. “Support vector machine applied to predict the zoonotic potential of E. coli O157 isolates” PNAS 2017).

8. Listeriosis outbreaks in South Africa and Europe - when more information becomes available i.e. main vehicle(s) of transmission, this may be relevant to UK supply chain. The demographic for cases in South Africa has affected a large proportion of young children in addition to other age groups, so appear to be unusual compared to other outbreaks.
9. STEC (O121) in flour – outbreak in Canada (2017) - perhaps not emerging but further evidence of this type of commodity being contaminated.
10. Greater use of the internet for shopping. Access to foods that do not come via “controlled” channels and potentially lack of control in delivery systems may introduce risks (raw & RTE products packed together; lack of suitable temperature controls etc.).
11. Incorrect information relating to food safety given out in publications and broadcasts—e.g. gourmet cooking guides & chef lead TV programmes.
12. Reduction in antimicrobials/antimicrobial treatments due to perceived/real health benefits that could/will increase microbiological risk.
13. Greater food poverty and thus risks of people using out of date or bootleg food. Risk of people having insufficient money for safe food depends on things like whether wages continue to stagnate, whether introduction of Universal Credit has temporary or permanent effect.
14. The drive to reduce plastic packaging may bring additional risks to food safety, depending on what/how replaces it.
15. Increasing number/proportion of 85+ in population, who have greater vulnerability to certain bugs and possibly worse food safety practices.
16. Viruses remain a significant potential issue and no work on controls has been progressed – this needs some attention.

- Is there any information that needs to be brought to the FSA’s attention to help consumers make choices based upon current evidence?

1. Clear labelling of country of origin on all food items, and particularly raw meats and poultry meat.
2. Editorials in The Veterinary Record and the letter relating to the detection of *Brucella suis* / raw pet food diets, available at <http://dx.doi.org/10.1136/vr.i4972>
3. Risk of listeriosis in the changing scenario of new biologics and immunotherapies being prescribed for a rheumatological, neurological and haematological malignancies.
4. Risks associated with consumption of raw (unpasteurised) milk appear to be poorly understood by consumers.
5. Undercooking of burgers and raw products.
6. One of the most visible criticisms aimed at the relationship between the FSA and consumers concerns advice relating to the thorough cooking of meat (e.g. repeated criticism in articles in the BarfBlog). As the use of technology becomes more widespread and more accessible it may be an appropriate time for objective consideration of evidence about tip sensitive meat thermometers and to develop appropriate advice for UK consumers.
7. This progression might be replicated in relation to other technological changes such as improved fridge thermometers, internet of things etc.
8. There is a growing competition between provision of food safety information and a general desire to reduce food waste and it is currently unclear how risk assessment approaches can reduce conflict.
9. Info about changing patterns of consumer cooking/eating at home and chef and consumer eating out. What is the new equivalent of 'risky' behaviours like raw burgers and pink chicken livers, and how should FSA advise/respond?

- Are there any risks or opportunities associated with new food technologies not already considered by the ACMSF?

1. Although low temperature cooking and sous vide have been looked into, this is still causing issues with business due to the lack of information provided.
2. A move towards reduced packaging and away from "single use" containers and utensils etc., and towards smaller environmental impact in general, may introduce additional considerations with respect to food hygiene and food safety but, within the current unmonitored framework, this change is difficult to assess?
3. Efforts to change packaging that can be recycled – need to ensure that new packaging materials are properly assessed to ensure they don't impact on

food safety e.g. presence of *Bacillus* spores in paper and other materials derived from wood.

4. Future planned reduction in plastic use in food packaging. Plastic forms a barrier film to reduce cross contamination risk, is a moisture and gas barrier. Concerns over what happens as plastic is removed from use within packaging materials with respect to cross contamination, and barrier films.
5. Newer analytical techniques giving outputs that are unfamiliar/ difficult/ impossible to interpret. How to assess risks and take appropriate risk management actions from newer types of test/analytical result.
6. Others better qualified to say than me but in general I'd wonder if there are technologies that were previously too expensive or difficult to implement for mainstream use that now have become or are becoming mainstream.
7. Increasing use of high pressure processing
8. Increased consumption of raw foods (that traditionally would have been subject to cooking) e.g. raw veg smoothies, etc.
9. Pop up restaurants
10. Removal of the use of certain disinfectants and biocides – impact on microbiological food safety

- What do you view may be the main emerging issues, risks and opportunities following UK exit from the EU?

1. See Bullet Point 1 above.
2. UK scanning surveillance procedures for various hazards in foods (FSA) and in the agricultural sector (Defra) are likely to be evaluated when trade agreements are negotiated with other countries after Brexit. Effective surveillance provides assurance regarding food safety and quality for exports of livestock, materials or food products from the UK and to UK consumers regarding goods imported into the UK. Resource constraints on scanning surveillance need to be balanced against these potential benefits. (CT)
3. Legal requirements and possible changes to legislation. Impact on guidelines etc. Lack of influence on new legislation, guidelines etc so may not suit UK circumstances.
4. Legislation involved in importation of various foods and products such as eggs/chicken etc may need to be reviewed.
5. Standards introduced and the associated control of foodstuffs from non EU direct imports

6. Will organisations in the food chain look to reduce standards if rules etc are less stringent?
7. Role and support of ECDC in investigating multicountry outbreaks, exit will weaken position of UK in asking for control measures being implemented by other countries.
8. Loss of data sharing on food related issues with the EU (e.g. interaction and ability to feed into RASFF).
9. If we are no longer at the European food safety meetings, will we miss out on getting early warning of new risks and opportunities in microbiology and food safety?
10. Issues surrounding the food system following UK exit from the EU are largely unpredictable. In the short/medium term issues surrounding data collection and data sharing may be important (there may be a reduced imperative on systematic data collection and an increased reluctance to share information that leads to advantage; in contrast there may be opportunities to streamline and target data collection activities in the UK). It is interesting to note that historically risks and risk assessment procedures have been used effectively to build barriers so that changing priorities in risk assessment may be an unintended consequence of an EU exit.
11. Poorer communication related to emerging issues and UK not participating in EU fora where food safety issues are addressed.
12. European member states actions towards reduction in biocide use and potential concern over the impact of this on food safety
13. Will UK retain NRLs that offer in depth expertise on specific microbiological issues/organisms.
14. Loss of scientific/technical expertise from UK food production, food research and regulatory environments.

- Is there anything else to bring to the FSA's attention?

1. That there is already evidence of foods containing bacteria exhibiting resistance to some critically important antimicrobials (CIAs) that are banned for use in EU countries (e.g., carbapenems) being imported into the UK.
2. Cooking of pink duck breasts and items such as chicken liver parfait is still continuing, but are these practices safe and what is the current and future guidance.
3. Following on from previous ACMSF horizon scanning it important to note a further separation between the evidence used in the formation of risk assessments and scientific advice and the evidence presented by frontline

science research. A large majority of responsive mode research funding in the areas of food pathogens and food microbiology concerns the collection and organization of molecular information (dominantly sequence typing but also other 'omics based methodology) whereas it is difficult to identify instances in which this information has contributed to risk assessments (beyond tracking and tracing of outbreaks) e.g. In "Significance of WGS for surveillance, source attribution and microbial risk assessment of food borne pathogens" Current Opinions in Food Science 2016 the authors say "In contrast to the recognised additional value of WGS for outbreak investigation its application in microbiological risk assessment is largely unexplored and faces important challenges". The decoupling of the research effort and the science underpinning advice is a concern.

4. Currently within the FSA most risks are characterized and communicated on a one dimensional semi-quantitative scale (the EFSA scale that connects a subjective probability range with a probability term ranging from extremely unlikely to extremely likely is widely adopted). As the risks being considered become more complex (disaggregated) the benefits of multi-dimensional representation becomes much more apparent. A two-dimensional (matrix) representation (in terms of likelihood and impact severity) is included in the current National Risk Register of Civil Emergencies 2017 and may have advantages in communication of complex events or small frequency high impact events ("A scale of risks" Risk analysis 2014). A consistent flexible (graphical) expression of food risks may have significant advantage.
5. There are also significant challenges surrounding the expression of uncertainties in relation to emerging complex risks. It is particularly difficult to express uncertainty in relation to assessments that include evidence from sources that do not easily facilitate repetition – i.e. WGS, machine learning, user centric sources. EFSA are currently building guidance on expression of uncertainty in relation to "Weight of Evidence" and "Biological Relevance" but it is unclear how this initiative can be reflected in expressions of uncertainty for microbiological hazards.
6. ACMSF report on non-proteolytic *C. botulinum* is in need of a review to consider whether the risks and controls remain appropriate.