Meeting

100th Meeting of the ACMSF - Reflections

Issue

1. The Advisory Committee on the Microbiological Safety of Food (ACMSF) was set up in 1990 to provide expert advice to Government on questions relating to microbiological issues and food. Between December 1990 and February 2022 ACMSF would have met one hundred times. This excludes meetings of subgroups who meet in closed sessions. This paper is to provide members the opportunity to reflect on the committee's work since it was established and have a forward look on emerging/future issues in relation to microbiological safety of food.

Background

2. ACMSF is an independent Advisory Non-Departmental Public Body of the Food Standards Agency comprising of a Chair and nineteen members. The Committee was established in 1990, on the recommendation of the Richmond Committee (Committee on the Microbiological Safety of Food, chaired by Sir Mark Richmond) set up by the Government in 1989 to provide advice on the microbiological safety of food. Following the setting up of the FSA in 2000, food safety and other interests of consumers in relation to food became the responsibility of the FSA and from 1 April 2000, ACMSF was required to advise the FSA, rather than UK Health and Agriculture Ministers as previously.

3. ACMSF provides the FSA with independent expert advice on all aspects of the microbiological safety of food across the whole food chain. To develop this advice the Committee's expert independent members meet three times a year in open session to assess the risk to human health from microorganisms in relation to

food. This risk assessment takes place in accordance with the FSA's scientific governance and openness procedures. The Committee's meeting agendas, papers, minutes and reports (since 2000) are published on a dedicated website and plenary meetings are open to the public.

4. The Committee's terms of reference is to:

"To assess the risk to humans of microorganisms which are used or occur in or on food and to advise the Food Standards Agency on any matters relating to the microbiological safety of food."

5. ACMSF provides advice in response to requests from the FSA and also on matters that Committee members themselves identify as important. The Committee keeps itself informed through its close links with the FSA, Food Standards Scotland, UK Health Security Agency and Defra of the developing trends in relation to foodborne disease.

6. ACMSF is concerned with the whole food chain. This is reflected in the membership which is drawn from a wide spectrum of disciplines. They are currently drawn from: food microbiology, microbiological risk and food processing, food microbiology research, food retailing, commercial and public sector catering, environmental health, human epidemiology, medical microbiology, clinical microbiology, public health medicine, veterinary medicine, veterinary public health and epidemiology, microbiological risk assessment and virology. The Committee also has one consumer Member.

7. Between December 1990 and February 2022 ACMSF have addressed many topics on microbiological safety of food, reviewed many of the FSA's risk assessments, produced risk assessments, reviewed some of the FSA's microbiological food surveys and considered issues brought to the committee from other government departments (FSS, Defra and UKHSA). In addition, via its subgroups the committee have undertaken in-depth studies of particular topics and published the following technical reports which have been used to inform risk

management decisions.

- Vacuum Packaging and Associated Processes (1992)
- Salmonella in Eggs (1993)
- Interim Report on Campylobacter (1993)
- Verocytotoxin-Producing Escherichia coli (1995)
- Poultry Meat (1996)
- Foodborne Viral Infections (1998)
- Microbial Antibiotic Resistance in Relation to Food Safety (1999)
- Second Report on Salmonella in Eggs (2001)
- Mycobacterium bovis (2002)
- Second Report on Campylobacter (2005)
- Infant Botulism (July 2006)
- Botulism in Cattle (December 2006)
- The Safe Cooking of Burgers (2007)
- Botulism in Sheep and Goats (2009)
- The Increased Incidence of Listeriosis in the UK (2009)
- Toxoplasma in the food chain (2012)
- An update on viruses in the food chain (2015)
- An update on the microbiological risk from shell eggs and their products (2016)
- Antimicrobial Resistance in the food chain; research questions and potential approaches (2018)
- Third Report on Campylobacter (2019)
- Report on multidimensional representation of risks (2020)
- Report on non-proteolytic Clostridium botulinum and vacuum and modified atmosphere packaged foods (2020)

8. To contribute to this discussion on the committee's past work and forward look into future work, Prof Bill Keevil (ACMSF Chair), Prof David McDowell (former Interim Chair/former Deputy Chair) and Dr Paul Cook (Former ACMSF Scientific Secretary) have provided comments (see annex I -III) members may wish to consider as you discuss the following questions.

Action

9. Members are invited to consider the following questions:

- What were the most important or biggest impact pieces of work you were involved with on the Committee?
- What are the most important issues or challenges that the Committee may face in the next five years? Within the next 100 meetings (30 years)?

Secretariat

January 2022

Annex I

100TH ACMSF Meeting Comments – Dr Paul Cook

1) What are the most important or biggest impact pieces of work you have been involved with on the Committee?

There are many areas of work which the committee has been involved in which are important not only in terms of the subject being considered but also the value and impact of the committee's advice. This spans the full breadth of work which he committee has been involved with. The committee's technical reports are authoritative and are well regarded both nationally and internationally. The long list of reports and key papers on diverse subjects underlines the important contribution the committee has made to the microbiological safety of food.

There are too many areas to list them all but I have selected a few examples.

The committee's work on antimicrobial resistance (AMR) and the food chain has made an important contribution to the government's work to tackle AMR. The committee's first report published in 1999 was one of the most comprehensive situation assessments in this area and paved the way for the establishment of the cross governmental MARC (now DARC) group by Defra and the VMD. The DARC group developed the government's response to the report and the committee's recommendations helped shape future surveillance and research as well as influencing the direction of policy in relation to the food chain. Subsequent reviews of progress in this area by the committee notably the report of the "Task and Finish" report (2018) have continued to influence the direction of future work and the food safety part of the Governments national action plan on AMR.

The committee produced 3 reports on Salmonella and eggs in 1993, 2001 and 2016 bridging a very important period in the changing epidemiology of Salmonella infections in people and interventions to tackle Salmonella in the UK egg production chain. The 2016 report provided the evidence enable the consumer advice to be changed reflecting a lower risk associated with shell eggs produced under the Lion Code or a demonstrably-equivalent comprehensive scheme.

The committee now has a food incidents group subgroup to provide urgent advice to the FSA on microbiological issues but prior to this advice was sought from the committee on a different basis. One particular example which stands out is the 2006 outbreak associated with chocolate contaminated with Salmonella. A Salmonella contact group was convened by the ACMSF at short notice to review risk assessment information relating to this incident and the committee's comments The conclusions from this meeting were published on the FSA website. A large recall of chocolate products drew widespread media interest.

2) What are the most important issues or challenges that the Committee may face in the next five years? Within the next 100 meetings (30 years)?

Climate

We are already beginning to see how global challenges such as reducing food waste, energy consumption and single use plastics will impact on the food chain and potentially food safety considerations. Tackling climate change is already having an impact on the food chain and over the next 30 years we will be approaching an even more critical point in terms of our commitments in this area. It is likely that these challenges will impact on microbiological food safety in different areas and the committee is likely to be called upon to provide advice to the FSA.

Population

We and many other countries, including those not limited to Europe and North America, have an aging population which will increase further over the next 30 years. Consumer vulnerability from a microbiological food safety point of views is likely is likely to become increasingly important and will need to be factored in to risk.

Diet

There is likely to be an increased push for consumers to move to a more plant-based diet or switch to animal protein sources that consume fewer resources and/or contribute less waste or by-products that impact on climate (e.g. methane). More efficient use of these waste products is likely to become important and we may also see a shift in the patterns of foodborne disease.

Antimicrobial resistance

By 2050 we will have reached a key date envisioned in the O’Neill report (2016) on antimicrobial resistance which predicted that by that time we could have 10 million AMR-related deaths per year. With this in mind the committee is well placed to continue providing advice to the FSA to support its work on AMR and food safety including national action plans which are already part of the government’s 20-year vision in this area.

Paul Cook

January 2022

Annex II

100TH ACMSF Meeting Comments – Prof David McDowell

1) Most important/biggest impact pieces of work during my time as a member of ACMSF.

The safe cooking of burgers (2007)

Rationale for selection This report identified and disseminated the emerging significant risks of infections of VTEC (verotoxigenic E. coli) - a relatively rare infection with considerable implications in terms of potentially fatal or life changing conditions (HUS and TTP) in humans. The impact of this report was that it provided timely accurate advice to FSA, producers/retailers and consumers, about the importance of cooking burgers properly. This might appear to be a rather simple target/process – but it was going against a rising tide of desire among suppliers/consumers to supply/eat very lightly cooked (i.e., semi raw) burgers and related products.

Antimicrobial Resistance in the food chain; research questions and potential approaches (2018)

Rationale for selection - As a task and finish report this document had a format which was very different from previous format for ACMSF reports. For example, it had a significantly shorter timescale (<1 year), established by FSA before commencement of the working group activities, and was specifically designed to take a more intensive approach to rapidly achieve more focused and defined objectives. Additional benefits from this report included detailed collaboration with other colleagues in FSA (e.g., FSA Risk Assessment and Analytics), to gain clearer (and faster) classification of advice to be delivered to FSA. Such classification included presentation of high/low priorities to FSA. Potential options

included “action/no action within FSA”, “maintaining watching brief”, “leading actions with other agencies” and “encouraging actions by other agencies “. Such classification has assisted FSA in developing a structured suite of AMR studies, to achieve FSA objectives in this increasingly important area of food safety.

Multidimensional representation of risks (2020)

Rationale for selection. The need for this report was identified during an ACMSF horizon scanning workshop which recognised insufficiencies in the one-dimensional risk assessment being used by ACMSF and FSA. Improvement in this area was clearly essential, as such assessments are a key function of ACMSF/FSA. The report presents the development and integration of an improved multidimensional representation of risks which has been proved to improve the quality and clarity of risk assessments presented to FSA.

Whole genome sequencing (WGS)

Rationale for selection. The decision within ACMSF to recommend to FSA that (where possible) all surveillance and research studies should include WGS analysis, has had a significant impact. This approach provides much more information *faster” than (sequential) traditional methods of description /detection/analysis of bacteria of interest (e.g., outbreaks /surveillance). Information gained in approximately 7 days (rather than approximately 20 days by traditional means) enables early, rapid, effective evidence-based decisions on the control of the bacterial “culprit” of an outbreak. WGS analysis also allows rapid comprehensive comparisons among agents of outbreaks in multiple locations and/or jurisdictions. WGS is also helpful in One Health analyses, e.g., spread across human/animal/environment sources of infection, and additional important impact characteristics such as efficiency of dissemination of undesirable factors such as AMR and/or the presence/nature of virulence genes.

2) Most important issues /challenges re next 5 years & next 100 meetings (30 years)

The impact of increasingly AMR strains of currently controllable food related pathogens within the food chain will pose significantly different challenges,

especially to higher risk consumers, i.e. young, old, pregnant and those with relatively naïve, suppressed or weakened immune systems. The impacts of such AMR are likely to include increased morbidity (with extended outbreaks) and higher mortality rates among infected patients. The widely held concept of food borne illness as mildly unpleasant brief bouts of “stomach upsets” may give way to the above effects.

The impact of fake news, as vividly demonstrated in the current pandemic, has clearly demonstrated the difficulties which may arise in trying to protect ill-informed cynical/detached consumers from the challenges associated with sourcing our foods from more distant/different countries. This is not to say that our food/food supply chain protection is better or worse than the food/food supply chain protection in other countries. Rather, the challenge is that other countries have different food histories/ formats/processes/ethnicities/knowledge which are different from the UK. We need to understand that our food related immunological profile can be relatively naïve in relation to different foods sourced from different/diverse sources.

Within the UK, consumer preferences and habits in relation to food balance, selection, storage and consumption continue to change and evolve, sometimes (too often) in the complete absence of (or interest in) adequate knowledge of the potential risks involved in such changes. The two preceding paragraphs note the increasing risks implicit in such changes. However, ACMSF (and FSA) will probably need to increase their efforts (in collaboration with other agencies) to facilitate further food safety education. This would need to involve those responsible for the safe production of our food, and better food safety practice at all stages of the UK food chain – including consumers.

Climate change will continue to have a number of significant effects in relation to food production and food safety. These include: which foods we can continue to sustainably produce, against a background of changes in humidity, availability of adequate fresh water, changes in pest types and impacts, reduction in biodiversity, more violent and adverse weather, floods, and persistent droughts.

Unfortunately, the more complex and diverse food chains become, the greater the opportunities and profits to be extracted by food fraud. It is likely that ACMSF will be more frequently involved in advising the FSA National Food Crime Unit, and the equivalent agency in Scotland.

Valid environmental concerns in relation to the adverse effects of plastic packaging mean that it is very likely that ACMSF (with others) will be asked to contribute to the assessment of the safety risks involved in the use of bio-based food contact materials. This is likely to include research to investigate the potential biological/microbial interactions between these materials and food within the UK human food chain, including the important need to ensure that retail and consumer domestic practices are suitably modified to ensure food safety.

David McDowell

January 2022

Annex III

100TH ACMSF Meeting Comments – Prof Bill Keevil

1) What are the most important or biggest impact pieces of work you have been involved with on the Committee?

It has been an absolute pleasure to be involved in the work of FSA as Chair of ACMSF and participating in several of its subgroups. Without doubt, during my tenure we have been beset by the major public health problem of COVID-19. I and another colleague contributed to the development of the important FSA report on: Qualitative risk assessment on the risk of food or food contact materials as a transmission route for SARS-CoV-2 (FSA)

https://www.food.gov.uk/research/research-projects/qualitative-risk-assessment-on-the-risk-of-food-or-food-contact-materials-as-a-transmission-route-for-sars-cov-2

The ACMSF were also involved in reviewing FSA report: Risk assessment: What is the risk to UK consumers of exposure to viable SARS-CoV-2 via the consumption

of farmed produce that have become contaminated via exposure to infectious virus via wastewater systems, specifically, bivalve molluscs originating in UK waters, and crops (particularly ready to eat fresh fruits and vegetables) grown on land treated with sludge in the UK?

https://www.food.gov.uk/research/research-projects/coronavirus-risk-to-uk-consumers-via-shellfish-and-crops-grown-on-land-treated-with-sewage-sludge-risk-assessment

These reports reassured Government and the public at a time of great uncertainty. Our ACMSF Horizon Scanning Workshop raised various research questions and this encouraged FSA to fund the project Assessing the survival of SARS-CoV-2 on food surfaces and food packaging materials, at a range of temperatures, humidity levels and time periods representative of a retail environment. It is due to complete in Summer 2022.

https://www.food.gov.uk/research/research-projects/assessing-the-survival-of-sars-cov-2-on-food-surfaces-and-food-packaging-materials

Consideration of how COVID-19 might lead to changes in reporting of food incidents/cases/outbreaks during Covid 19 were addressed by FSA in the Food and Y 2 Wave 1 and 2 surveys.

The Committee also reviewed the important Norovirus Attribution Study (NoVAS) which suggests that food is likely to be responsible for a higher proportion of the 3 million annual UK norovirus cases than previously thought, although person-to-person transmission remains the most common cause. Commercial catering operations, including takeaways and restaurants, were found likely to be responsible for a majority of foodborne norovirus; lettuce sold at retail is estimated to account for 16-30% of all foodborne norovirus cases, and other fresh produce (fresh and frozen) for 6-7%; oysters represented 3% of cases but present the highest risk per individual serving.

Of note, the ACMSF subgroup on non-proteolytic *C. botulinum* and vacuum and modified atmosphere packaged (VP/MAP) produced a thorough report on key aspects relating to the risk of non-proteolytic *C. botulinum* and VP/MAP foods, and

recommendations for extended product shelf-life. This was well received by FSA and industry.

Our other groups continue to do important work for FSA, including Newly Emerging Pathogens Working Group; Surveillance Working Group; Subgroup on Microbiological Risk Assessments in Relation to Food Incidents; Subgroup on Quaternary Ammonium Compounds and Biocides Used in Food processing; and Regulated Products Subgroup.

2) What are the most important issues or challenges that the Committee may face in the next five years? Within the next 100 meetings (30 years)?

Climate change poses major challenges to the world's health in the near and long terms, affecting soil and water quality and ultimately the food production chain. This will increase not only arid zones, stressing the crops and making them more susceptible to infection, but also more frequent flooding leading to faecal ingress of agriculture soil and water systems providing irrigation and supplying husbandry facilities, and storm overflows of sewage polluting shellfish beds. This will inevitably lead to more faecal bacterial and virus contamination of the crops and animals, and contaminate the supply chain.

A likely scenario is that there will be successors to SARS-CoV-2 coronavirus and other emerging viruses providing more of a food risk. After emergence of Alpha to Delta variant, and now Omicron (BA.1), other variants under investigation are emerging such as BA.2 and this is likely to continue in the same way as new variants of influenza virus arise each season. Avian influenza outbreaks have taught us that migratory birds are but one route of pathogen transmission, even across continents, with a subsequent risk to the food chain. Zoonotic vectors remain as important as ever for the future challenges ahead of us and the One Health approach is essential for many risk assessments.

Prior to COVID-19, AMR was already causing worldwide concern, as exemplified in the O'Neill and WHO Reports, with projections of 10 million deaths a year by 2050 and a cost of trillions of dollars. This threat has not subsided and more needs doing from a One Health perspective, rather just restricting the availability of antibiotics to the public and to farming industry. The ACMSF Antimicrobial Resistance Working Group has already made important contributions to this area to FSA by reviewing several draft reports including Survey of EU Harmonised

Surveillance of antimicrobial resistance (AMR) in bacteria from Retail Meats (Year 5 – Beef and Pork, 2019) and Review of Antibiotic Use in Crops, Associated Risk of AMR, and Related Research Gaps, as well as being made aware of an AMR use in crops study.

Bill Keevil

January 2022