Advisory Committee on the Microbiological Safety of Food

Annual Report 2015

Advises the Food Standards Agency on the Microbiological Safety of Food

Contents

Subject	Paragraph
Foreword	
Introduction	1
Chapter 1: Administrative Matters	2 - 19
Membership	2 -11
Appointments	2
Periods of appointment	3
Spread of expertise	4 - 5
Appointments in 2015	6
Re-appointments in 2015	7
Committee and Sub-Group meetings	8 - 10
Current membership and Declarations of Interests	11
Personal liability	12
Openness	13 - 18
Improving public access	13 - 15
Open meetings	16 - 18
Work of other advisory committees and cross-membership	19
Chapter 2: The Committee's Work in 2015	20 - 154
Update on viruses in the food chain	20 - 22
Initial response to the ACMSF virus report	23 - 27
Risk assessment of Salmonella from shell eggs	28 - 32
Assessment of the risk of avian influenza virus via the food chai	i n 33 - 36
Shiga toxin producing <i>E. coli</i> (STEC) in Food	37 - 50
Risk assessment for the use of <i>Mycobacterium bovis</i> BCG Danis Strain 1331 in cattle: risks to public health	sh 51 - 61

Subject Para	Paragraph	
Food safety risk of recycled manure solids used as bedding for dairy cattle	62 - 67	
Histamine in cheese	68 - 76	
Outcome of horizon scanning workshop	77 - 84	
FSA Board paper – Framework for risky foods and its application to burgers	85 - 89	
Surveillance	90 -120	
Campylobacter Retail Survey	90 - 95	
Food and You Survey: Findings from Wave 3	96 -114	
A microbiological survey of pre-packed ready-to-eat sliced meats at retail in UK small to medium sized enterprises	115 -120	
Epidemiology of Foodborne Infections Group	121 - 131	
General papers	132 - 138	
Triennial Review	132	
Food Standards Scotland	133	
EFSA document on uncertainty	134	
Progress report on ACMSF recommendations	135	
Changes to plant protection product MRLs: potential impact on food safety	136-137	
Collaboration with FSA's Social Science Research Committee	138	
ACMSF Ad Hoc and Working Groups	139 - 144	
Working Group on Antimicrobial Resistance	139	
Working Group on Surveillance	140-141	
Ad Hoc Group on Eggs	142 - 144	
Outcome and Impact of ACMSF advice	145-152	
ACMSF Involvement in Incidents	153	

Informatio	n papers	154
Chapter	3: A Forward Look	155 - 161
Future wor	k programme	155 - 161
Annex I	Papers considered by ACMSF in 2015	
Annex II	Work plan	
Annex III	Membership	
Annex IV	Register of Members' Interests	
Annex V	Code of Practice for Members of the ACMSF	
Annex VI	Good Practice Guidelines	
Glossary of	fterms	
Glossary of	fabbreviations	
References	3	

The Advisory Committee on the Microbiological Safety of Food (ACMSF) was established in 1990 to provide the Government with independent expert advice on the microbiological safety of food.

The Committee's terms of reference are:-

to assess the risk to humans from microorganisms which are used, or occur, in or on food, and to advise the Food Standards Agency (FSA) on any matters relating to the microbiological safety of food.

The various issues addressed by the Committee since its inception are detailed in this and previous Annual Reports $^{1\text{-}23}$ and in a series of subject-specific reports. $^{24\text{-}42}$

Foreword



I am pleased to present this report which 1. summarises the work of the ACMSF during 2015. provides expert advice The ACMSF to Government questions on relating to microbiological issues and food. I hope you will find this report and the information it contains

useful in finding out about the work of the Committee covering 1 January to 31 December 2015. Details of membership, agenda and minutes are published on the ACMSF webpage at: <u>https://acmsf.food.gov.uk/</u>

- 2. During 2015, the Committee had three meetings and its active subgroups had eight meetings. At the March meeting we published the long-awaited report on viruses in the food chain. The report considered the most important viruses associated with foodborne viral infections; norovirus, hepatitis A virus and hepatitis E virus. Key recommendations include the need for more research to improve understanding in certain areas (such as foodborne viral disease and contamination of food through sewage contamination) and to improve consumer awareness of the risks.
- 3. We were asked to revisit the Committee's 2001 risk assessment of *Salmonella* from shell eggs. We examined the work of the Committee from 1991 when a subgroup was set up to consider the extent to which eggs were responsible for the incidence of foodborne disease due to *Salmonella* and the work of a subsequent subgroup that published the Second report on *Salmonella* in Eggs. Following deliberations we agreed to setup a subgroup to further consider this topic in detail.
- 4. The FSA sought views from the Committee on the risk from Shiga toxin-producing *Escherichia coli* (STEC) in food to support decision making regarding the safety of these foods, including those that are ready-to-eat, raw or where the effectiveness of measures such as heat treatment in destroying STEC or washing of produce to remove STEC is unclear. We acknowledged that knowledge gaps, uncertainties in the available evidence and complexity of the organisms involved make it difficult to assess the risks associated with STEC in foods. While highlighting that the presence of STEC in a RTE food is a risk to public health we pointed out that such risks could be managed by application of food safety and hygiene controls by consumers and businesses.
- 5. Other risk assessments we considered during the year include: risk assessment for the use of *Mycobacterium bovis* BCG Danish Strain 1331 in cattle: risks to public health (carried out by the Animal and Plant Health Agency and funded by Defra) and the assessment of the risk of avian influenza virus via the food chain (carried out by the FSA).

- 6. The Committee gave its opinion on the food safety implications of the use of recycled manure solids (RMS) used as bedding for dairy cattle. Members were informed that reduced availability and increasing cost of more traditional bedding materials, had over a period of time led to the use of RMS as bedding for dairy cattle on a limited number of farms across the UK. Following our discussion particularly as there were significant data gaps and the need to have clear understanding of microbial behaviour, we agreed that we were not in a position to answer the questions put to us. The FSA and the Defra representative confirmed that the two departments were working together to ensure that data gaps are addressed.
- 7. We were provided with the findings of Wave 3 from the FSA's Food and You Survey. This is the FSA's flagship social survey of consumer's reported behaviours, attitudes and knowledge relating to food safety and other associated topics. We found the presentation useful and gave our support for Wave 4 and identified issues for the FSA to consider.
- 8. The Committee was updated on the outcome of the Epidemiology of Foodborne Infections Group (EFIG) meetings. EFIG updates covered a number of topics which included: reports of *Salmonella* from livestock species not subject to *Salmonella* National Control Plans and Trends in laboratory reports for *Salmonella*, *Campylobacter*, *Listeria monocytogenes* and *E.coli* O157 in humans.
- 9. Following a horizon scanning workshop and follow-up discussions we agreed to a list of microbiological themes and topics which were ranked in terms of strategic priority and urgency. We agreed to setup a subgroup to tackle *Campylobacter* in the food chain first as we recognised it was 10 years since the ACMSF's report on *Campylobacter* had been published and tackling *Campylobacter* in chicken was a strategic priority for the FSA.
- 10. Looking to the future, the Committee has noted the pace of work of the subgroup on eggs who are working towards publishing their report in 2016. Their report will update the Committee's assessment of the risks to consumers, including vulnerable groups, from eating lightly cooked raw shell eggs and their products. We will continue to monitor closely developments regarding antimicrobial resistance (AMR) and the food chain via the working group on AMR. The Committee will ensure that it receives regular updates from the Working Group and publishes them on the website.
- 11. I should like to thank Members of the Committee and its Working and *Ad Hoc* Groups, without whom the ACMSF would not operate effectively and to the many other individuals and organisations that have helped the Committee with its work this year. As ever, I am also extremely grateful for the support of the Secretariat whose efforts in

ensuring the efficient and effective conduct of Committee business is invaluable.

Stokien

Professor Sarah O'Brien Chair

Introduction

1. This is the twenty-fourth Annual Report of the Advisory Committee on the Microbiological Safety of Food and covers the calendar year 2015.

Chapter 1: Administrative Matters

Membership

Appointments

2. Appointments to the ACMSF are made by the FSA, after consultation with United Kingdom Health Ministers (i.e. the "Appropriate Authorities") in compliance with Paragraph 3(1) of Schedule 2 to the Food Standards Act 1999. The Agency has resolved that appointments to the ACMSF should be made in accordance with Nolan Principles⁴³, the guidance issued by the Office of the Commissioner for Public Appointments (OCPA)⁴⁴ and the Government Office for Science Code of Practice for Scientific Advisory Committees⁴⁵. The FSA is not bound to follow OCPA guidance, as ACMSF appointments do not come within the remit of the Commissioner for Appointments and the guidance applies only to appointments made by Ministers. However, although ACMSF appointments are not made by Ministers, the Agency has decided that it would nevertheless be right to comply with OCPA guidance as best practice.

Periods of appointment

3. To ensure continuity, appointments to the ACMSF are staggered (usually for periods of 2, 3 or 4 years) so that only a small proportion of Members require to be appointed, re-appointed or retire each year.

Spread of expertise

- 4. A wide spectrum of skills and expertise is available to the ACMSF through its Members. They are currently drawn from commercial catering, environmental health, food microbiology, food processing, food research, food retailing, human epidemiology, medical microbiology, public health medicine, veterinary medicine, and virology. The Committee also has one consumer Member.
- 5. Members are appointed on an individual basis, for their personal expertise and experience, not to represent a particular interest group.

Appointments in 2015

6. Two members were appointed to the ACMSF during 2015: Professor Miren Iturriza-Gómara (to provide the Committee with expertise on virology) and Mr Alec Kyriakides (to provide the Committee with food retail expertise). Their period of appointment runs from April 2015 to 31 March 2019.

Re-appointments in 2015

 The periods of appointments for Dr Roy Betts and Prof Goutam (Bob) Adak expired on 31 March 2015 and they were re-appointed for a further 4 years from 1 April 2015 until 31 March 2019. 46

Committee and Sub-Group meetings

- 8. The full Committee had a horizon scanning workshop and met three times in 2015 on 29 January, 25 June and 1 October. All the meetings were chaired by Professor Sarah O'Brien and were open to members of the public.
- 9. The Working Group on Antimicrobial Resistance (Chair: Professor David McDowell) met four times in 2015. Outline of the meetings are at paragraph 139.
- 10. The *Ad Hoc* Group on Eggs (Chair: Professor John Coia) met four times in 2015. The meetings were used to consider their terms of reference, scope of work, outputs of the group and discussions on their report An update on the microbiological risk from shell eggs and their products (see paragraphs 142-144).

Current membership and Declarations of Interests

11. Full details of the membership of the Committee and its Working and *Ad Hoc* Groups are given in Annex III. A Register of Members' Interests is at Annex IV. In addition to the interests notified to the Secretariat and recorded at Annex IV, Members are required to declare any direct commercial interest in matters under discussion at each meeting, in accordance with the ACMSF's Code of Practice (Annex V). Declarations made are recorded in the minutes of each meeting.

Personal liability

12. In 1999, the Secretary of State for Health undertook to indemnify ACMSF Members against all liability in respect of any action or claim brought against them individually or collectively by reason of the performance of their duties as Members (Annual Report 1999⁸ paragraph 6 and Annex III). In 2002, the Secretariat asked the FSA to review this undertaking, given the fact that, since 2000, the ACMSF had reported to the FSA where previously it had reported to UK Health Ministers. In March 2004 the Food Standards Agency gave a new undertaking of indemnification in its name, which superseded the earlier undertaking given by the Secretary of State (see Annex IV of 2004 Annual Report¹⁴).

Openness

Improving public access

13. The ACMSF is committed to opening its work to greater public scrutiny. The agendas, minutes and papers (subject to rare exceptions on grounds of commercial or other sensitivity) for the full Committee's meetings are publicly available and are posted on the ACMSF website. Also, on the Committee's website are summaries of meetings of the Working and *Ad Hoc* groups. ACMSF's website can be found at:

http://acmsf.food.gov.uk/

14. The Committee also has an e-mail address:

acmsf@foodstandards.gsi.gov.uk

15. In accordance with the Freedom of Information Act 2000, ACMSF has adopted the model publication scheme which sets out information about the Committee's publications and policies.

Open meetings

- 16. Following the recommendations flowing from the FSA's Review of Scientific Committees⁴⁷, the ACMSF decided that from 2003 onwards all of its full Committee meetings should be held in public.
- 17. Two of the 2015 Committee meetings were held in Aviation House, the FSA's London Headquarters. The January meeting which was preceded by a horizon scanning workshop was held in Manchester.
- 18. All of these open meetings follow a common format. Time is set aside following the day's business for members of the public and others present to make statements and to ask questions about the ACMSF's work. The names of participants, the organisations they represent, and details of any statements made, questions asked and the Committee's response, are recorded in the minutes of the meeting.

Work of the other advisory committees and crossmembership

19. The Secretariat provided Members with regular reports of the work of other Scientific Advisory Committees advising the FSA in 2015. Mrs Rosie Glazebrook ACMSF consumer representative is a member of the Advisory Committees on Carcinogenicity (COC) and Mutagenicity (COM) and a member the FSA Consumer Advisory panel. The ACMSF Chair (Professor Sarah O'Brien) is a member of the General Advisory Committee on Science (GACS) and the National Expert Panel on New and Emerging Infections (NEPNEI).

Chapter 2: The Committee's Work in 2015

An update on viruses in the food chain

Update on viruses in the food chain

- 20. The Committee at its January meeting received an update (from the Chair of the Ad Hoc Group on Foodborne Viral Infections) on the outcome of the public consultation on the subgroup's report 'Update on viruses in the food chain⁴⁸. The group had assessed the extent of foodborne viral infection in the UK and produced an updated risk profile based on their findings. They considered information on all foodborne viruses including new and emerging viral pathogens and identified that the most important viruses associated with foodborne infection were norovirus, hepatitis A virus and hepatitis E virus. The focus of the group's report was on these foodborne viral infections in the UK. The report also took into account two recent comprehensive reviews of viruses in food that were published by WHO (2008) and EFSA (2011). The report provided key information that could be used to inform Risk Assessment and Risk Management on foodborne viruses across government.
- 21. The Committee approved the report for public consultation that took place between March and May 2014. Comments received in response to the consultation were considered by the *Ad Hoc* Group and responses were provided to the issues raised. The report was amended in response to the comments received.
- 22. The Committee approved the publication of the report and also published its responses to the public consultation on the FSA website.

Initial response to the ACMSF virus report

23. Following the publication of the report in March the FSA provided an update at the June meeting on how they were addressing the recommendations in the report⁴⁹. It was explained that the update was largely work in progress but it demonstrated how the Agency has started make progress addressing Committee's to in the recommendations. It was stated that a full Government response will follow in due course but the Agency was starting a new approach of updating the Committee on progress with recommendations it has made at the earliest possible opportunity. Members were informed that the Agency had already begun work on funding a number of research projects in relation to foodborne viruses such as a norovirus attribution study looking at the contribution the food chain makes to the burden of

UK acquired norovirus. It was highlighted that the work includes a package to develop a capsid integrity assay to measure norovirus infectivity and also a package of work investigating the prevalence and levels of norovirus in a range of different foods. An outline of a critical review published by the Agency to distinguish between infectious and non-infectious norovirus which identified knowledge gaps in detection methods was presented to members. Other reviews commissioned by the Agency on survival and elimination of hepatitis A, E and norovirus were drawn to the Committee's attention.

- 24. Members noted a large NERC funded research study which has received top up funding by the Agency to support rapid identification of pathogenic micro-organisms in environmental media. FSA is supporting quantitative detection of human pathogenic viruses with freshwater-marine continuum.
- 25. The FSA mentioned an ongoing study investigating the effectiveness of standard depuration practices in reducing norovirus contamination in oysters, before reassuring the Committee that the issue of hepatitis E and possible association with shellfish remained firmly on the Agency's priorities. Members learnt that detailed investigation of the heat stability of hepatitis E in meat and meat products remains a key priority area for the Agency in addition to other organisations such as EFSA and the pig industry and the Agency would consider whether a collaborative study may be possible with these organisations.
- 26. The FSA informed the Committee that it was working with EFSA to organise a workshop on foodborne viruses in early 2016 likely focussing on the norovirus, hepatitis A and hepatitis E and the Secretariat would keep the Committee informed about this and further developments on progressing other recommendations.
- 27. The Committee welcomed the approach of regular updates on progress relating to recommendations it has made to allow it to see the impact of its advice. The Committee acknowledged that the Agency had started making good progress in addressing its recommendations.

Risk assessment of Salmonella from shell eggs

- 28. In January the committee was asked to consider whether they wished to update their assessment of the risks to consumers, including vulnerable groups, from eating lightly cooked or raw shell eggs and their products⁵⁰. The Committee had not reviewed this subject in detail since 2001 and the paper was a starting point for any subsequent risk assessment.
- 29. Dr Upadhyay (Microbiological Risk Assessment Branch) reminded members that the FSA's advice had always been that raw or runny eggs could cause food poisoning, particularly for vulnerable groups.

This stemmed from the situation in England and Wales in the late 1980s when a major epidemic of foodborne infection was attributed to chicken and shell eggs contaminated with *Salmonella* Enteritidis. The paper presented to members outlined the work of the Committee from 1991 when a subgroup was set up to consider the extent to which eggs were responsible for the incidence of foodborne disease due to *Salmonella*, and the subsequent work of a second subgroup which culminated in the Committee's second report on the issue which was published in 2001.

- 30. Dr Upadhyay said that outbreaks attributed to *Salmonella* Enteritidis were now markedly lower than in the 1990s. Additionally, relating to laying hen flocks, levels of contamination had been well below the EU designated targets for a number of years. With this in mind, she invited the members to consider whether it would be timely for them to assess the current level of risk from eggs.
- 31. There was a wide ranging discussion during which the following points were made:
 - The risks may have decreased but not disappeared. Advice may need to be nuanced bearing in mind there are differences between UK produced Lion brand eggs cooked at home, catering eggs which may carry a higher risk, and niche markets such as duck eggs. Consumers would not know whether eggs served in a hotel or restaurant were UK produced eggs, or if it was a pasteurised egg product.
 - In some organisms, including Salmonella, new variant strains emerge. Sometimes the dominant strain is not virulent, and the risk may appear to be decreasing. However, since there were a number of factors that had changed since the Committee last considered this, including changes in the organism, changes in the way eggs are purchased (including online) and the way they are handled, it raised the question of whether the Committee's previous advice was still appropriate for the current situation.
 - Now that new technologies were available it may be that looking at just *Salmonella* in eggs is too restrictive and it might be better to think about the wider health risks from shell eggs. Even if the risk from *Salmonella* has decreased, there may be other microbiological risks.
 - In the 1990s it was very clear what the target was, i.e. to reduce the risks from *Salmonella* in eggs. But now it is not so clear what we are trying to achieve, bearing in mind that zero risk is not possible. Is there a systematic approach?

- Sales of eggs had changed, and interventions had changed. There was also a need to include duck eggs which had not been considered previously.
- There was some indication from social science that people took more notice of advice when they believed the facts underlying the evidence. This supported the need to explain how things had changed, with examples, such as emerging issues with duck eggs.
- It could be helpful to consider what circumstances might lead the committee to change its advice.
- 32. The Chair summed up the discussion by concluding that members supported setting up a subgroup to carry out further work in this area and that Professor John Coia had agreed to chair such a group. She would consider who else might be involved and approach members following the meeting. The questions to be tackled would need some refinement, but would include looking at health risks in the round both from hen and other types of eggs, based on the current situation, and considering the circumstances that might lead the Committee to change its advice.

Assessment of the risk of avian influenza virus via the food chain

- 33. In October the FSA asked the Committee to revisit the issue of risk of avian influenza virus via the food chain following a number of recent outbreaks on poultry farms in the UK. Dr Manisha Upadhyay presented a revised risk assessment for the Committee to consider⁵¹. She reminded members of previous risk assessments by the Committee in 2003, and reviewed in 2006 and 2007, when the conclusion was that the risk to human health from exposure to avian influenza (AI) viruses through the food chain was low. Since then there had been a number of recent outbreaks of AI on poultry farms in the UK and the FSA felt it was timely and appropriate to do a sense check with the Committee to ensure that its advice remains appropriate.
- 34. The up-to-date risk assessment took into account more recent data, including global outbreaks. Risk assessment highlighted that transmission of AI viruses from birds to humans tends to occur in people who were in close contact with birds, rather than through food. The paper also highlighted the uncertainties in assessing the risk of acquiring avian influenza via the food chain. Dr Upadhyay explained that EFSA had produced a risk level classification which was not available when the previous risk assessment had been carried out. Using this classification the paper suggested that the overall health risk related to AI viruses via the food chain was very low.
- 35. It was acknowledged that whilst there was some evidence that the avian influenza viruses have the potential to cause infection via the GI

route, other factors (saliva, gastric acidity) were considered to present barriers to infection.

- 36. Members welcomed the risk assessment and felt that all relevant areas had been covered. The following comments were made.
 - It was noted that the risk level classification was based on the frequency of occurrence rather than severity. Further pieces of research that could be added were suggested. One was a study of Al virus particles in frozen duck meat coming from China to South Korea, and another was a study by David Swayne on levels of the virus in eggs which had been deliberately infected.
 - One member queried that since rules governing residues for some disinfectants (including quaternary ammonium compounds) may be about to change, this may need to be taken into account in the future when seeking to contain AI virus risks. It was also mentioned that a report was available about the process of containment following an AI incident in Holton in Suffolk and this may provide information that would be useful in risk assessment in similar situations.
 - It was pointed out that when using the term high pathogenicity it should be clear whether this was referring to high pathogenicity in avian species or in humans.
 - Members agreed that the overall health risk related to Al viruses via the food chain was very low. It was suggested that the FSA should make it clearer that the change in risk from low (for a previous ACMSF assessment carried out several years ago) to very low (for this current assessment) did not imply that the risk had lowered, but that a different risk level classification system had been used in the current assessment (EFSA's risk level classification). According to EFSA's risk level classification, "very low" risk is assigned to a risk that is very rare but cannot be excluded. It was acknowledged that this point had already been made in the assessment but could benefit from being made more explicitly.

Shiga toxin producing *E. coli* (STEC) in Food

37. The FSA sought views from the Committee on the risk from Shiga toxin-producing *Escherichia coli* (STEC) in food to support decision making regarding the safety of these foods, including those that are ready-to-eat (RTE), raw or where the effectiveness of measures such as heat treatment in destroying STEC or washing of produce to remove STEC is unclear. Dr Jo Edge (FSA) and Dr Claire Jenkins (PHE) introduced the risk assessment⁵².

- 38. The areas the FSA's paper and presentation covered include: hazard identification and characterisation, current understanding of pathogenic STEC characteristics: serogroups and virulence determinants, exposure assessment and proposed approach taking into account strain severity.
- 39. It was reported that the European Commission was in the process of drafting a guidance document which would assist competent authorities of Member States when they are confronted with food with positive STEC results. The draft EC guidance would advise that when the laboratory results have confirmed the presence of the hazard (i.e. presence in an isolated *E. coli* strain of an *stx* gene), the contaminated food may be classified, for the ease of convenience, according to two risk profiles: food profile 1 and food profile 2.
- 40. **Food profile 1** would include contaminated RTE or non-RTE food frequently or usually consumed without a sufficient treatment able to eliminate or reduce to an acceptable level the risk of infection by STEC. Food profile 1 should be considered as the riskiest food as regards the possibility of human infection.
- 41. **Food profile 2** would include only contaminated food very likely to be consumed with the appropriate treatment able to eliminate or reduce to an acceptable level the risk of infection by STEC (e.g. food intended to be thoroughly cooked before consumption) and for which clear information is provided to the consumers, including information on the label, and possible other information generally available to consumers concerning the avoidance of specific adverse health effects from a particular food or category of foods.
- 42. It was underlined that the FSA's current view regarding the confirmed presence of STEC in RTE food (i.e. *stx* in an isolated *E.coli* strain) is an unacceptable risk to public health and that Food Business Operators should take appropriate action to remove contaminated food from the market.
- 43. Dr? Linden Jack (FSA) provided additional comments to the presentation given by Jo Edge and Claire Jenkins. She remarked that the risk assessment and ACMSF's view on the strength of available evidence indicating whether these are sufficient was key in supporting decision making on STEC in foods. She said members' comments would be valuable in considering the impact on public health as the FSA was keen to make sure any risk management intervention made is proportionate given that the feedback from stakeholders on the draft guidance was that the approach outlined would have significant impact

on Food Business Operators. Members were asked when considering the risk assessment to acknowledge areas of uncertainty and gaps and assess the strength of the evidence relating to the risks associated with STEC in food via three questions.

- 44. The following comments were made by Members in the ensuing discussions:
 - Members acknowledged that the questions put to them were complex and it was difficult to provide definitive advice. It was pointed out that ACMSF was in the same position as the EU expert group who had struggled to address the issues raised in the questions put to the Committee.
 - Although the presentation highlighted that molecular testing would be used for investigations, the absence of any element of quantification and a sampling plan was raised. It was acknowledged that whilst there was currently no specific sampling plan for STEC in foods in the interim the sampling rules adopted for sprouted seeds would be employed to test for the presence for this organism (testing/analysing 25g of food for the presence of the pathogen).
 - As the issue of quantitative risk assessment was raised, one member commented that the risk assessment was not a straightforward one as multiple hazards had to be aggregated in order to achieve a single risk assessment.
 - The multipliers for foodborne disease used in the risk assessment were queried as it was confirmed that there were lots of cases of non O157 infections that were clinically milder than for infections with STEC O157 and there were also cases of asymptomatic infections. It was mentioned that the multipliers used were taken from the EU trends and sources report that looked at outbreaks that occurred in 2013.

Question 1: Whether it is appropriate to consider the presence of stx in an isolated *E.* coli strain ("presence of STEC") in RTE food (and foods that will not receive sufficient treatment to eliminate STEC) to present an unacceptable risk to health?

- 45. Members considered that the presence of *stx* in an isolated *E. coli* strain ("presence of STEC") in RTE food (and foods that will not receive sufficient treatment to eliminate STEC) presents an unacceptable risk to health.
- 46. It was felt that this was a complex subject area which should be considered with caution particularly as there is uncertainty regarding the importance of some of the genes present in STEC. Whilst recognising that not all STEC strains are pathogenic it was agreed that the magnitude of risk in relation to the presence of STEC in food is

unclear. It was noted that there was presently little if any prevalence data concerning non-O157 STEC in food.

Question 2: If there is sufficient evidence to determine whether for food in profile 2, the presence of stx in an isolated E. coli strain of serogroup O157, O26, O103, O145, O111, O104 with [1] eae or [2] aaiC and aggR presents an unacceptable risk to health particularly taking into account control measures by consumers and FBOs such as caterers?

47. Members indicated that there was insufficient evidence to determine whether those foods in profile 2 present an unacceptable risk to public health. Members were not convinced that control measures work all of the time. It was underlined that these organisms should not be present in the food chain.

Question 3: Confirmation of an isolated *E*. coli strain in food samples that are positive for stx can involve the practical issues outlined in paragraph 20. If analytical results are only available for the genetic results without confirming their presence in an isolated *E*. coli strain, would the Committee consider it possible to assess the potential risk to public health?

- 48. Members noted that if analytical results are only available for the genetic results without confirming their presence in an isolated *E. coli* strain it would currently not be possible to assess the potential risk to public health.
- 49. In conclusion members recognised that knowledge gaps, uncertainties in the available evidence and complexity of the organisms involved make it difficult to assess the risks associated with STEC in foods. Members considered the presence of STEC in a RTE food to be a risk to public health. Members were also concerned about the presence of STEC strains most likely to cause severe illness being present in non-RTE foods. Members agreed that the risks could be managed by application of food safety and hygiene controls by consumers and businesses but noted there is evidence that controls can break down and lead to outbreaks of severe illness. In addition, it was agreed that the paucity of available information showed that there was no merit in setting up a small group to further consider this issue.
- 50. The Social Science Deputy Chair Deputy Chair and ACMSF ex-officio noted that the FSA's comments on this subject have shown the need for careful consideration when gathering intelligence in the area of consumer handling and consumption habits because of changes in some subsectors of the population.

Risk assessment for the use of *Mycobacterium bovis* BCG Danish Strain 1331 in cattle: risks to public health

- 51. The FSA asked the Committee to provide comments on the Risk assessment for the use of *Mycobacterium bovis* BCG Danish Strain 1331 in cattle: risks to public health carried out by the Animal and Plant Health Agency (APHA) and funded by the Department of the Environment, Food and Rural Affairs (Defra)⁵³.
- 52. Dr Emma Snary (APHA) gave a presentation to the Committee on the APHA risk assessment. Dr Snary explained that a bovine TB vaccine (*Mycobacterium bovis*) could help to control bovine TB cases in England and Wales and is part of the vaccination control plan for cattle. The strain of *M. bovis* intended to be used in this vaccine is the same as the human *M.bovis* strain but has been optimised for use in cattle. As part of the approval process for this vaccine a risk assessment needs to be carried out, to assess the risks to public health should the vaccine enter the food chain. The risk assessment started in October 2013 and completed almost a year ago. Dr Snary explained that she was project leader and Andrew Hill and Alex Berriman of APHA also played key roles.
- 53. Dr Snary outlined that the assessment asked two key risk questions:
 - What is the risk of human illness with CattleBCG due to the consumption of a typical serving of milk and milk products?
 - What is the risk of human illness with CattleBCG due to the consumption of a typical serving of beef products?
- 54. Dr Snary stated that unpasteurised and pasteurised milk and cheese and mince were assessed. Dr Snary highlighted that lack of data and uncertainties in the data meant that the overall assessment was qualitative but in as far as possible, quantitative methodology was used. For unpasteurised milk quantitative risk assessment was performed, but for cheese and beef this was not possible. For quantitative approaches, deterministic models were used rather than a stoichastic approach. The scenario analyses employed focussed on considering the probability of illness if the scenario occurs and the probability of the scenario occurring.
- 55. Dr Snary stated that a number of key worst case assumptions were adopted during the assessment. It was assumed that all UK cattle are given the BCG cattle vaccine which is worst case scenario as there are areas in the UK that either have no bovine TB or are at low risk of bovine TB and vaccination would be unlikely in these areas. A lot of data were obtained from APHA experiments and it was assumed that the data would fully represent the situation if the vaccine was rolled out. No information is available on the survival of cattle BCG in different environments and it was also assumed that cattle BCG would have a

similar survival to human *M. bovis*; it was assumed that the cattle BCG strain would not grow at any points in the processes used to produce the food products assessed. It was assumed that the clinical symptoms caused by childhood adverse reactions to BCG would be similar to foodborne illness. It was also assumed that immunocompromised people against medical advice would consume these foods. Dr Snary stated that the EFSA 2006 guidance on risk ranking was used for this assessment.

- 56. Dr Snary outlined that the risks (per serving) to the healthy population were estimated to be Negligible via milk, milk products and beef.
- 57. The assessment estimated increased risks to the immunocompromised population (Negligible Very Low risks for regional BCG disease due to consumption of beef slaughtered <3 months post-vaccination).
- 58. The presentation of Dr Snary can be found on the ACMSF website with the papers for the June 2015 meeting.
- 59. The presentation was generally well received by the Committee. A number of points of clarification were also raised. Members enquired whether the strain of *M. bovis* being assessed is a standard human BCG organism or is it cattle adapted. Members also asked for information on what dose is given to cattle and how this compares to a standard human dose. Members were keen to determine the frequency at which vaccination is likely to produce disseminated disease in cattle. Members remarked that the presentation revealed that the vaccine strain is resistant to at least one antimicrobial agent and queried the possible treatment if someone became infected with the BCG strain.
- 60. A member queried the assumption that the only potential route of transmission of *M. bovis* in this risk assessment is via oral ingestion. It was mentioned handling/preparation of meat from vaccinated animals may also play a role in transmission via the cutaneous or ocular routes. APHA stated that consideration of this potential route was not originally requested and that the risk associated with cross-contamination will be lower than that for oral ingestion. APHA agreed nonetheless that this could be considered. The Committee agreed that ocular and cutaneous routes are potentially important.
- 61. Members also stated that there would be some value in the risk estimate being recalculated using alternative scenarios such as pasteurisation failures. Dr Snary agreed to consider this further.

Food safety risk of recycled manure solids used as bedding for dairy cattle

- 62. In January the FSA sought the Committee's views on the food safety implications of the use of green bedding/recycled manure solids for dairy cattle⁵⁴. The FSA asked Members:
 - Whether they agree with the assessment that the main microbiological food safety risk is raw drinking milk produced by dairy cattle reared on systems using Recycled Manure Solids (RMS) as bedding.
 - To identify any additional data and research requirements that would allow microbiological food safety risks to be more fully quantified. These were in addition to those highlighted in the Gap Analysis outlined in the scoping study taking account of the further research proposal.
- 63. Members were informed that reduced availability and increasing cost of more traditional bedding materials, had over a period of time led to the use of RMS as bedding for dairy cattle on a limited number of farms across the UK. Dairy farmers in the UK are increasingly interested in using suitable recycled waste materials, such as RMS, recycled wood shavings or paper sludge ash as animal bedding due to the high costs of virgin bedding, pressure to recycle waste materials and reported animal health and welfare benefits for some recycled bedding materials.
- 64. It was confirmed that the use of RMS bedding within the UK is currently limited. Best estimate is that between 70-80 farms in GB and a further 5-10 in Northern Ireland currently use this material. Members were informed that its use is widespread in the United States and the EU. Currently 800 Dutch dairy farmers (4-5% of all dairy farmers in the Netherlands) are using RMS as bedding. It was reported that Dutch research experience suggested that bedding management was more important than bedding type or initial bacterial load. RMS is produced by squeezing water out of the manure by a variety of press mechanisms to produce a material with around 35% dry matter content. The main food safety risk would appear to be associated with use of RMS on holdings producing raw drinking milk. The agreed conditions of use include a specific requirement that milk from production holdings using RMS must be pasteurised.
- 65. Defra and Scottish Government have agreed to allow use of RMS as bedding for dairy cattle in England and Scotland to allow data to be gathered, provided farmers comply with certain conditions and follow best practice management criteria.
- 66. The following comments and questions were raised by the Committee in the ensuing discussions:

- Reference was made to the work that has been done and the current measures to control VTEC in livestock where the key issue is to avoid cross contamination. It was stressed that this practice may facilitate cross contamination in the event of animals excreting high number of VTEC.
- It was stated paper ACM/1165 had not given attention to the microbiological hazards in raw milk (and cheese made from raw milk) associated with this type of practice and to consider whether pasteurisation can control this hazard.
- There was concern that consumers of unpasteurised milk and unpasteurised cheese will be exposed to additional risks.
- There was unease on how this practice relates to the hygiene rules on storage, handling and disposal of farm/animal waste as RMS consists of faecal material that may include VTEC, *Salmonella* and other pathogens.
- It was pointed out that RMS users would be homogenising the material thereby distributing pathogens widely.
- It was highlighted that data in relation to pathogen loads on all types of bedding (straw, RMS etc.) had not been included for consideration.
- It would be useful to consider data on the load of spore formers on RMS and other beddings.
- Data were missing on the issue of AMR (it was noted genomics may help in gathering relevant information).
- Understanding the behaviour of pathogens in the product would be vital as there is uncertainty on this at present.
- Some of the conditions for users listed at ACM/1165 annex II (14 prescribed conditions) are impractical to carry out particularly in situations when farmers may have diseased cattle shedding VTEC.
- There was concern on the issue of dust blowing around.
- Members were not convinced that research proposal at ACM/1165 annex 3 would be able to address the questions that was designed to answer.
- It was noted that the use of RMS is not just a food safety risk but there are possible risks to farm workers, their families and consumers in relation to health and safety and hygiene.

- It was highlighted that some consumers might be surprised that this type of material can be approved for use for food producing livestock and it was noted that should this practice be adopted, Government should be careful to avoid communicating mixed messages in relation to food hygiene practices.
- Consideration should be given to the possible toxicological issues that may need to be addressed.
- 67. In the light of the above particularly as there were significant data gaps and the need to have clear understanding of microbial behaviour, the Committee agreed that they were not in a position to answer the FSA's questions. The FSA and the Defra representative confirmed that the two departments were working together to ensure that data gaps are addressed.

Histamine in cheese

- 68. Following a recent discussion on histamine in cheese by the Committee on Toxicity of Chemicals in Food, Consumer Products and the Environment (COT), the FSA (through Dr Manisha Upadhyay) to brought this topic to the Committee to seek members views on issues relating to histamine in cheese⁵⁵. She reported that poisoning by the biogenic amine histamine is a well-recognised phenomenon that arises from the consumption of food, particularly certain types of scombroid fish, which can have high levels of histamine present as a result of bacterial spoilage. Dr Upadhyay also stated that histamine can be present as a consequence of microbial fermentation in the production of foods such as certain cheeses or sausages. She highlighted that incidents of illness involving histamine or suspected histamine in cheese were first reported to the FSA in 2003. It was noted that the risk based control of biogenic amine formation in fermented foods was comprehensively reviewed by EFSA in 2011.
- 69. Dr Upadhyay explained that histamine levels in cheeses vary considerably and the paper shows the histamine levels associated with a large variety of different cheeses and highlights the extent of variability in histamine and total biogenic amine content.
- 70. She noted that between 2001 and 2007, there were two reported incidents to the FSA linked to histamine in cheese; between 2008 and 2015, there were twenty such reported incidents (provisional data provided for members use only). Dr Upadhyay pointed out that the FSA was not aware of any incidents involving cheese prior to 2003 including before the FSA was formed.
- 71. Members were informed that the Committee on Toxicology of Food, Consumer Products and the Environment meeting discussed histamine in cheese at their June 2015 meeting. Given that there is a

microbiological basis for the production of biogenic amines in cheese, the FSA brought this issue to the ACMSF's attention for members to note the reports of histamine poisoning associated with cheese reported to the Agency for comments.

- 72. Members noted that this issue was an example of where the hazard is microbiological but the effect toxicological. Two areas where members commented were on the incidents reported to the FSA involving histamine in cheese and on the two recommendations from the EFSA BIOHAZ panel Opinion from 2011.
- 73. On the incidents data it was explained that the information provided was a combination of outbreaks/cases and also incidents where high levels of histamine have been found in cheeses. As information provided to members was a provisional/snapshot of cases it was stated that the issue of histamine in cheese will come back to members when more definitive data are available.
- 74. Members endorsed the EFSA BIOHAZ panel's recommendation "that concluded accumulation of biogenic amines in fermented foods is a complex process affected by multiple factors and their interactions, the combinations of which are numerous, variable and product-specific. Therefore, risk mitigation options, which are based on controlling those factors/interactions, cannot therefore be considered and ranked individually but considered in the context of general principles."
- 75. A member drew attention to the recommendation that stated that "microorganisms intended to be used as starter cultures in any fermented food should be confirmed as not being biogenic amine producers and able to outgrow autochthonous microbiota under conditions of production and storage" questioning if cheese manufacturers were able to screen their microorganisms for nonbiogenic amine producers. It was mentioned that large cheese manufacturers tend to screen starter cultures prior to selection.
- 76. As there was no particular action for the Committee on this issue, members noted the paper.

Output from horizon scanning workshop

- 77. In January the Committee had a horizon scanning workshop and follow-up discussions at the Committee's January and June meetings^{56.} The workshop was opened with a presentation on the FSA Strategic Plan 2015 2020 and an overview on the FSA Science and Evidence Strategy. Members had completed a questionnaire before the workshop which had asked the following questions:
 - Can you identify any emerging issues that might present a risk to the public?

- Is there any information that needs to be brought to the FSA's attention to help consumers make choices based upon current evidence?
- Are there any risks or opportunities associated with new food technologies not already considered by the ACMSF?
- Are there any risks or opportunities arising for consumers as a result of the changing landscape of food production?
- Is there anything else to bring to the FSA's attention?
- 78. The questions were considered in group sessions. Following discussion there was agreement on a group of common themes which members agreed to take forward under the following headings.
 - Impact of new technologies: advances in whole genome sequencing, in metagenomics of pathogens and samples, interpretations from resulting data from the application of these technologies in a risk assessment context, the way food processing is changing and novel processes focussing on current food processing technologies and other technologies on the horizon. Members agreed that two subgroups could be set up to consider the above topics.
- 79. The other headings included:
 - Changes in the food system: exotics and imports, new sources of food/ingredients, globalisation of food supplies, internet sales.
 - Societal/Social change: consumer information, communication, influencing behaviour; use of new media and improving science communication.
 - Climate change: how it impacts on behaviour of pathogens and other organisms such as *Vibrio* spp...
 - Antimicrobial Resistance (AMR): a huge cross governmental issue. It was highlighted that ACMSF already has an active working group but may need to consider what more can be done as part of the subgroup's ongoing work programme.
 - Understanding the impact of ACMSF's work in supporting the FSA, how the advice is used in risk management and how to evaluate impact of the Committee's advice.
- 80. Members agreed with the suggestion to prioritise the above headings as it was recognised that they were broad. Subsequent meetings were employed to decide the way forward.
- 81. At the June meeting the Committee endorsed the ACMSF Chair and the horizon scanning workshop rapporteurs recommendation ranking of the themes/topics which are as follows:
 - Genomics
 - Changes in the food system

- Climate change
- Societal change
- Antimicrobial resistance
- 82. Other topics that were considered important were: *Campylobacter*; and understanding the impact of the Committee's work and the use of their advice in risk management.
- 83. It was noted that demographic change in terms of the challenges of an increasingly elderly population was another area likely to become important in the future. The subject of using the Newly-Emerging Pathogens Working Group, which met infrequently to discuss particular topics was also flagged as it was felt this might have a wider role in horizon scanning.
- 84. Members agreed that the subject of genomics should be tackled first, and that a subgroup should be set up to take this forward.

FSA Board paper – Framework for risky foods and its application to burgers

- 85. At the October meeting Mr Steve Wearne (FSA Director of Policy) was invited to update the Committee on outcome of the September 2015 FSA Board meeting in relation to the framework for risky foods and its application to rare burgers and on the proposed next steps on how the FSA Board would like to engage with the Committee on this subject and other areas.
- 86. Steve Wearne reported that the FSA Board at the above meeting agreed a range of controls businesses should make sure are in place if they were serving rare burgers⁵⁷. The new approach agreed by the Board which was in the process of being implemented includes the following requirements:
 - businesses wanting to serve burgers rare pre-notify their local authority
 - the Board is given reassurances on the controls that suppliers of mince intended for consumption rare or lightly cooked in burgers have in place
 - effective consumer advisory statements will be required on menus where rare burgers are served; the Board agreed the FSA should take a lead ensuring these statements are consistent
 - an FSA communications plan is implemented to explain the risks and controls to the public. Infection rates continue to be kept under close review and any changes brought to the attention of the Board.
- 87. The areas (the first two relate specifically to rare burgers) the FSA Board would like to engage with the ACMSF include:

- Support and advice from ACMSF in modelling the individual and cumulative impact in terms of risk reduction of interventions in sourcing, primary processing, and further processing in food service, to inform further guidance to businesses and enforcement community.
- A proposed multidisciplinary working group drawn from GACS, SSRC, ACMSF and COT to review the framework for risky foods which the Board has adopted, supporting its use and further development around:
 - the coherence of the model;
 - evidence needs at each of the decision points and how to address them;
 - the design of triggers for a range of hazards for reference of issues back to the Board.
- Bringing risk assessment and risk management people and practices back closer together (reference the Codex model).
- Supporting self-tasking by Scientific Advisory Committees, not only in the generic future-facing issues that arise from horizon scanning such as use of genomics, but also around issues of direct and immediate policy relevance such as *Campylobacter* reduction (and possibly controls on minimally processed foods). An improved working relationship between risk assessors and risk managers would help in agreeing relevant questions for the committee to address on these agreed areas.
- 88. Members welcomed the update and suggestions on the way forward in particular the Committee endorsed the decision to look at the interface between risk assessment and risk management as it was underlined that it is artificial to separate the two completely.
- 89. The following comments were provided on the new approach agreed by the Board on rare burgers:
 - How the framework relates to children is not clear (what is the definition of children according to the framework). What was the reasoning for choosing children and excluding other vulnerable groups?
 - Is rare mince eaten as steak tartare and burgers made from meat other than beef within the scope of the framework?
 - Some of the findings of the thermal inactivation modelling study were queried in relation to the inactivation of STEC O157 and reductions of bacterial load although a Member mentioned that they had peer reviewed the research study.

- Because the subject of serving rare burgers is moving fast, the issue of monitoring the effectiveness of modelling interventions and identifying the best combination of treatments was raised.
- There were questions on how the food safety management plan in the framework relates to the 13 big burger chains, particularly in the area of "pathway management."
- It was underlined that the consequences of being infected by STEC could be devastating to the individual and could also damage any business linked to serving contaminated products.

Campylobacter Retail Survey

- 90. In June Dr Kevin Hargin (FSA Head of Foodborne Disease Control) briefed the Committee on the FSA's *Campylobacter* programme⁵⁸. He updated members on the setting up of the Acting Together on *Campylobacter* (ACT) Board which is comprised of senior representatives from various organisations including retailers, processors and farmers who can influence what happens within their organisations, and share best practices. Members were informed that work had been undertaken to scrutinize and improve on-farm procedures and biosecurity measures.
- 91. Dr Hargin outlined several strands of work at the processing stage: rapid surface chilling; using ultra-sound technology (Sonosteam); and the *Campylobacter* Abattoir Campaign, involving FSA field-based staff to raise awareness within plants and science-based messages via social media. He added that there were also some EU initiatives which may prove helpful in relation to processing (process hygiene criteria, a review of the Poultrymeat Marketing Regulations, and Peroxycetic acid (PAA) anti-microbial surface treatment).
- 92. Dr Hargin presented the 12-month results of the retail survey of UK produced whole fresh chickens which had been published in May 2015. He explained that the survey would be continuing for another year, possibly longer, and that due to changes in the market share Aldi and Lidl would be included along with the previously surveyed retailers. He added that retailers had taken various actions to improve their results, for example roast-in bag, 'do not wash' labels and improved consumer advice on packaging.
- 93. Finally Dr Hargin mentioned work aimed at caterers: a poster that had been distributed via Local Authorities, and a "safe method" for producing chicken liver pâté, and the "Don't wash raw chicken" message put out during Food Safety Week aimed at consumers. He commented that the chicken liver pâté recipe had been well received by caterers. At the end of the presentation Dr Hargin advised that an update paper would be going to the July 2015 FSA Board meeting and the proposals to them would include:

- To consider revising the present Campylobacter reduction target
- Whether to relate the Campylobacter reduction target to retailers
- Should legislative or non-legislative measures be considered in relation to *Campylobacter* reduction
- 94. Members were asked to comment on the presentation and the following points were made.
 - Cliff Gay, FSA's Head of Statistics, answered a question about changes to the sampling plan to use a set number of samples (100 samples per quarter) from each retailer rather than a sampling approach based on market share. Mr Gay confirmed that the difference in confidence intervals between the sampling approaches was very small. It was agreed that the ACMSF Surveillance Working Group should discuss the design for the next part of the retail survey further, with Kevin Hargin and Cliff Gay.
 - It was queried whether there were any lessons to be learnt from processing plants where there is significantly less packaging contamination than other plants.
 - Transportation modules and crates were also recognised as important routes of contamination.
 - A member noted that paper ACM/1182 9update on the activities of the Epidemiology of Foodborne Infections Group) highlighted that had been no reduction in laboratory reports there of campylobacteriosis in humans in the UK in recent years despite the reduction of Campylobacter in chicken. The assumption underlying the current Campylobacter reduction target was queried and whether, even if the target was achieved, it would deliver the desired reduction in human disease. Dr Hargin responded that the time periods for collection of data from Public Health England in the EFIG paper and the chicken survey results were not the same. It was also pointed out that the point of application of the target is the slaughterhouse rather than at retail. Another member commented that the FSA's target was based on a meta-analysis of a number of risk assessments of *Campylobacter* in chicken, including those from other European countries. Dr Hargin confirmed that the FSA economists were keeping the target under review as more data become available.
- 95. In conclusion the Chair suggested and members agreed that as it was 10 years since the Committee issued its report on *Campylobacter* a subgroup should be set up to revisit this, bearing in mind that reducing *Campylobacter* in chicken is a key strategic priority for the Agency.

Food and You Survey: Findings from Wave 3

- 96. Following the presentation the Committee received at its June 2014 meeting on the findings from the FSA's Kitchen Life Study members asked to be updated on the most recent wave of the Food and You Survey. The package of work provided evidence on domestic food safety practices including the Food and You Survey. Dr Laura Inman (FSA SSRU) was invited to present the findings of the study⁵⁹. Dr Inman provided background to the work. She reported that Food and You is the FSA's flagship social survey of consumers' reported behaviours, attitudes and knowledge relating to food safety and other associated topics. The survey uses a random-probability sampling methodology to provide a robust representation of the UK population aged 16 and above living in private households. It is a biennial survey and waves have been held in 2010, 2012 and 2014. The survey was carried out by TNS BMRB on behalf of the FSA. Food and You is an interview based survey with approximately 3000 interviews conducted at each wave. The overall UK response rate was 52% at Wave 3, similar to that at previous waves, and in line with other similar surveys. The survey was overseen by the FSA SSRC.
- 97. The survey's key objectives and purpose included to provide robust, cross-cutting information about consumers' reported behaviours, attitudes and knowledge relating to food issues, a rigorous evidence base to underpin policy decisions and essential baseline data about consumer behaviours.
- 98. Wave 3 UK findings were published as an Official Statistic in October 2014 in 4 bulletins: eating, cooking and shopping; food safety in the home; eating outside the home; and food poisoning and attitudes towards food safety and food.
- 99. The findings covered reported domestic food safety practices, eating out, reported experience of food poisoning and learning to cook and learning about food safety.
- 100. Regarding domestic food safety practices, it was reported that 80% reported always washing hands before starting to prepare or cook food as well as immediately after handling raw meat, poultry or fish in line with recommended practice. Over half of the respondents who had a fridge (53%) indicated that the fridge temperature should be between 0 and 5°C (the recommended temperature). The proportion of respondents reporting never washing raw meat/chicken appeared to have increased across waves. The proportion reporting never washing fruit and vegetable to be eaten raw was higher at Wave 3 compared to Wave 2. Three quarters of respondents (75%) reported that they would eat leftover food within two days of cooking it, in line with recommended practice.

- 101. 61% of respondents reported that the use by date was an indicator of whether food is safe to eat and reported always checking the date when cooking or preparing food.
- 102. 13% of those who reported having food poisoning in the last year had it medically diagnosed. Women were more likely than men to report going to see a doctor. On learning to cook/about food safety, learning from a family member/being self-taught are the predominant main methods of learning.
- 103. In conclusion Dr Inman underlined that Food and You Survey has been an important source of information about reported behaviours, attitudes and knowledge relating to food safety and associated topics and informed members that there are ongoing secondary data analysis for Wave 4. She indicated that SSRC was keen to engage with ACMSF on future projects.
- 104. Before inviting comments from members the Chair drew attention to the slide in the presentation under the heading food safety information sources. Family and friends came out top on current sources and internet search engines came out top on future sources she pointed out that this resonates with the Committee's horizon scanning discussion (societal/social change) where members recognised the need for improvement in the communicating of risk and science messages. Joy Dobbs (SSRC deputy Chair and ACMSF Ex-officio) acknowledged that it has been observed that people appear to find internet advice easily accessible.
- 105. A member queried if the 3,000 people interviewed were the same people interviewed in the previous Food and You Study (Waves 1 and 2). It was confirmed that the people used for Wave 3 were different from those used in Waves 1 and 2. Concerning the number of people who saw a doctor or went to the hospital highlighted in the slide on reported experience of food poisoning, there was a suggestion for a future survey to consider those who report suspected food poisoning incidents to pharmacies and receive medication there.
- 106. On the figures relating to sausages and burgers as it was confirmed that there was no detailed analysis, a member suggested that it would be helpful to split these in the event of a further study. Joy Dobbs noted comment and agreed that this would be taken into account if there is going to be a Wave 4.
- 107. A member asked if any thoughts had been given to calibrate the findings of this study against behaviour in order to authenticate people's real approach to food. Although this suggestion was noted, it was explained that the findings from Kitchen Life Study demonstrated that this may not add any significant value to the study.

- 108. As it was noted that children take home good food safety advice from school which they share with their parents, a member raised how the views of children could be picked up in future studies. It was suggested that the FSA should consider how to take into account children's views (under 16s) in Food Surveys.
- 109. The issue of how people respond to guidance and carry out the principles in the advice was raised as there was a suggestion that observations of how people demonstrate understanding of advice indicate that awareness does not necessarily mean people follow it. There was a suggestion that a series of questions may be included in a future survey to try and address this issue. Also suggested for consideration was using free text for future surveys as it was confirmed that it was not used for Wave 3.
- 110. Members welcomed the use of Index of Recommended Practice to measure behaviour as it was agreed that it had the potential to capture the understanding of domestic food safety practices.
- 111. In relation to the issue of food poisoning, it was highlighted that it would be useful to the food industry if consideration was given to the food(s) eaten before a food poisoning episode going back 48 hours as this would be useful in identifying the responsible food. It was underlined that people tend to blame the food they ate last and food they ate outside the home in the event of food poisoning.
- 112. Although cleanliness and hygiene came out as the most important factor considered when eating out, it was noted cleanliness in the dining area of restaurants may not correspond to the microbiological hygiene standards in the kitchen.
- 113. Members were encouraged that the awareness of FHRS/FHIS was high in the 4 UK countries.
- In summarising the Chair thanked Dr Inman and Joy Dobbs for the 114. presentation and expressed the Committee's support for Food and You Wave 4. Issues the Committee identified for consideration in Wave 4 included: seeking to capture food poisoning incidents reported to pharmacies, attempting to capture the foods eaten hours before a food poisoning incident, attempting to calibrate reported behaviour against actual behaviour using various methods of analysis such as root cause analysis and free texting, picking up the views of children (probably via adult surveys if it is not possible to have a specific survey for under 16s) and there was support for the continuous use of IRP as this would assist the FSA in tracking progress in its aim of improving public awareness and use of messages about good food hygiene practice at home. SSRC indicated that they will consult the Committee if they receive the go ahead for Wave 4 and when they are considering the survey protocols.

A microbiological survey of pre-packed ready-to-eat sliced meats at retail in UK small to medium sized enterprises

- The Committee was briefed by Dr Paul Cook (FSA) on the results of an 115. FSA survey on ready-to-eat sliced meats which had been published on the FSA website in December 2014⁶⁰. By way of background, members were informed that as part of the Foodborne Disease Strategy, Listeria monocytogenes was one of the priority organisms, because of the severity of illness it caused, particularly in relation to vulnerable groups. The former Health Protection Agency had previously noted that elderly people were more likely to purchase from smaller convenience stores than the general population. The FSA had undertaken a large survey of Listeria in cooked sliced meats in 2007 but as it had been based on market share, this only provided a limited data on smaller outlets, whereas the more recent survey focussed on this one specific sector. The survey had been carried out between April 2012 and January 2013. Over 1,000 samples had been taken from retail small to medium sized enterprises (SMEs) throughout the UK. Samples were taken for detection and enumeration of Listeria monocytogenes and other Listeria species and hygiene indicators (Escherichia coli and Enterobacteriaceae). Salt, pH, water activity, temperature, use-by date and storage instructions were also recorded.
- 116. The FSA drew the Committee's attention to the key findings of the survey as summarised in paper ACM/1168: 3.8% of samples had been found to contain Listeria monocytogenes and Listeria species were detected in 7% of samples. 71.3% of samples had a temperature above the industry guideline of 5°C and 32.7% were being stored above 8°C. Although the 2007 study of larger retailers was not directly comparable, due to differences in methodology and range of products tested, there were indications that there may be greater levels of contamination in samples from SMEs. As a result of the survey the FSA issued a letter to all Environmental Health Officers highlighting the need to remind food business operators of the importance of correct temperature control and staff training. Dr Cook added that the survey findings would inform the FSA's Listeria risk management programme as part of the overall Foodborne Disease Strategy which was currently under review.
- 117. A member expressed concern about the accumulation of risk factors highlighted by the survey: probable contamination of the product, being sold by SMEs with poor temperature control, which were more likely to be purchased by elderly people who, evidence showed, were more likely to carry out risky behaviours in handling food.
- 118. Members stressed the importance of stating clearly the confidence intervals in survey reports, particularly as here, when comparisons

were being made between the different sectors studied in the 2 surveys. The FSA agreed that it was not possible to make a statistical comparison but as part of the risk management programme the FSA had identified a need for more guidance for SMEs, many of which did not have as much technical support as larger retailers.

- 119. A member suggested that poor temperature control may, in fact, not favour *Listeria* because it may be outgrown by other organisms, so the consequences are not always predictable.
- 120. Summing up, the Chair said the survey was a useful piece of work but members had stressed the importance of confidence intervals and estimates of uncertainty with regard to prevalence estimates. Members had also raised the need for further clarification on the distributions of counts and consideration of outliers, with the possibility of being able to focus on higher risk products in terms of the *Listeria* risk management programme; using other indicator organisms to provide further information, and comments about the care needed with infrared temperature measurement which could record the surface of the pack rather than the underlying product; concern about the pack life of products being longer than 10 days which exceeded the *Clostridium botulinum* guidelines; and the combination of product and person likely to be eating the product.

Epidemiology of Foodborne Infections Group

- 121. The Committee was briefed (by Dr Paul Cook EFIG Chair) on the activities of the Epidemiology of Foodborne Infections Group (EFIG) in 2015^{61&62.} This covered updates on animal and human infections data, outcomes from food surveillance and findings from studies related to foodborne infections.
- 122. Annual *Salmonella* data January and December 2014 revealed 1,127 reports of *Salmonella* from livestock species not subject to *Salmonella* National Control Programmes (NCPs). This is 3.5% decrease compared with January December 2013 (1,168 reports) and a 2.3% decrease compared with January December 2012 (1,153 reports). The top serovars in cattle, sheep, pigs and ducks in 2014 were Dublin, 61:k:1,5,(7), Typhimurium and Indiana respectively. Between January and March 2015 (provisional data), there were 228 reports of *Salmonella* from livestock, which is 8% fewer than in the first quarter of 2014 (248 reports) and 23% fewer than in the first quarter of 2014 (248 reports) and 23% fewer than in the first quarter of 2013 (298 reports). The decline since 2014 is largely attributable to a decrease in *Salmonella* reports from cattle.
- 123. On the non-statutory zoonoses it was reported that there was a significant increase in the proportion of calf diarrhoea cases in which cryptosporidiosis was diagnosed in England and Wales. With respect to
Verocytotoxin-producing *E.coli* (VTEC) there were four farm related investigations in 2014.

- 124. Trends in laboratory reports for non-typhoidal *Salmonella*, *Campylobacter*, *Listeria monocytogenes* and *E.coli* O157 in humans in the UK were reported covering 2005-2014. Members were informed that *Salmonella* and VTEC O157 have declined marginally whilst *Campylobacter* and *Listeria monocytogenes* showed small increases in reporting in 2014 when compared to 2013.
- 125. The decline in non-typhoidal *Salmonella* infections was highlighted with the numbers of cases and rates of infection remaining in decline for the past 10 years in the UK. The decline in *S.* Enteritidis has continued in all countries except England which saw a small increase (4%) in 2014, reflecting the national outbreak of *S.* Enteritidis PT14b in the summer. Reports of *S.*Enteritidis PT4 infections continue to decline following interventions in the poultry and egg industries.
- 126. Reported *Campylobacter* infections remain relatively static in England Scotland and Wales, whilst Northern Ireland continue to report rates of infection considerably lower than those for the rest of the UK although rates have been climbing since 2008. All *Campylobacter* infections include travel and sources other than chicken.
- 127. Listeria monocytogenes remains lower than in most recent years, though with small reported numbers the data remain particularly stochastic, with the overall rate of infection in the UK fluctuating from 2.6 to 4.1 cases per million population in the past 10 years. For the UK as a whole the rate in 2014 was 21% lower than in 2005. There remains considerable variation between the rates in different countries though this is partially due to the small numbers being reported.
- 128. General outbreaks by country and by primary pathogen 2005-2014 revealed that in 2014 *Salmonella, Campylobacter* and *Clostridium perfringens* were the leading causes of general foodborne outbreaks in the UK.
- 129. Summary of recent trends in VTEC infections in England and Wales 2009-2014 showed that the most non-travel associated cases were of serotype O157. The predominant phage types in this period were PT21/28 and PT8 which account for over 60% of all cases and over 75% of cases in outbreaks; a higher proportion of cases were female, particularly in outbreaks.
- 130. Other issues EFIG considered at their meeting include the results from the FSA's year-long survey of *Campylobacter* on fresh chickens at retail between February 2014 and February 2015, the FSA funded project to characterise the *Campylobacter* isolates from the two infectious intestinal disease studies (IID1 and 2), current issues relating to Antimicrobial Resistance, food surveillance (a number of Public

Health England (PHE) coordinated food liaison group studies reports) and data accessibility.

- 131. The following comments and questions were raised by ACMSF Members in the ensuing discussions:
 - A member drew attention to PHE's recent changes in the reporting system and pointed out this may suggest that any future data considered by the Committee may not be comparable with data from the past. Dr Cook acknowledged that the FSA was aware of the recent changes being made to the surveillance system as this has been flagged at EFIG. He explained that the FSA and other bodies that use data from PHE should have confidence that information they receive is robust/informative in order to effectively carry out their functions. *Campylobacter* a top priority for the FSA was highlighted as an example of where reliable/comparable data was very important. It was added that further discussions will take place with PHE and other surveillance bodies on how best to tackle this issue.
 - The VTEC surveillance programme where the focus is mainly on *E.coli* O157 was queried. It was recognised that results from clinical data which are predominately O157 cases has informed the focus on *E.coli* O157. Dr Cook confirmed that PHE's enhanced VTEC surveillance should cover other VTECs.
 - Regarding microbiological testing biases Members noted that current guidance to diagnostic laboratories in Scotland recommends that samples from illness compatible with VTEC infection where O157 was not identified should be sent to reference laboratories. It was added that as a result of the above guidance there has been 25% increase in reports of non O157 VTEC cases. It was also highlighted that there was the possibility for the number of non O157 cases to increase in the future as diagnostic laboratories in the UK are moving to molecular tests for screening.
 - It was noted that other EU countries VTEC surveillance programme have reported a variety of VTEC serogroups.
 - A Member commenting on the increase in S.Typhimurium Definitive Type 193 in animals (27% increase in 2014 mainly attributed to pig isolates) drew the Committee's attention to the decline in APHA/Scotland Rural College (SRUC) submissions to Veterinary Investigation Diagnosis Analysis (VIDA). He highlighted that as Salmonella was a very common cause of death in pigs was concerned that the above stated increase gave an indication that industry may need to do more in controlling Salmonella on farms. It was underlined that farm veterinarians should be encouraged to realign their focus in efforts being made to control Salmonella. The Committee agreed that recent changes taking place at APHA and

SRUC are impacting on veterinary surveillance and emphasised that this would make interpretation of trends challenging.

 Referring to the outbreak data that was presented by country and by primary pathogen, a Member enquired whether this data was also available by stating the foodstuff responsible for illness. Dr Cook commented that EFSA has provided a grouping for categorising foodstuff implicated for infections and PHE could be requested to include vehicles for foodborne disease in future data they provide. It was pointed out that the EU Summary Report on Trends and Sources of Zoonoses, Zoonotic Agents and Foodborne Outbreaks provides information on foodstuff implicated for foodborne illness.

General

Triennial Review

132. Members were informed that the FSA was carrying out a Triennial Review of the six Scientific Advisory Committees for which the Agency is sole sponsor as part of the Public Bodies programme led by Cabinet Office. The review will cover ACAF, ACMSF, ACNFP, COT, SSRC and GACS. It is scheduled to run from July to December 2015. Professor O'Brien advised members that they may be consulted during the review.

Food Standards Scotland

133. Prof O'Brien informed members that Food Standards Scotland, which was established on 1 April 2015, had written to her outlining the arrangements for access to the Committee's advice on matters relating to microbiological food safety. As it may be necessary to revise ACMSF's (and other SACs) Terms of Reference (TOR), the FSA's Chief Scientific Adviser Team had suggested that revision of TOR should wait until the Triennial review is concluded.

EFSA document on uncertainty

134. The Committee was informed that the EFSA were carrying out a public consultation on how to characterise, document and explain all types of uncertainty arising in scientific risk assessments. ACMSF Secretariat agreed to circulate document to members and coordinate the Committee's response.

Progress report on ACMSF recommendations

135. Through paper ACM/1195 members received a feedback on the list of issues looked over the year at by the Committee and progress made by the FSA on the advice.

Changes to plant protection product MRLs: potential impact on food safety

- 136. Information paper ACM/1197 drew members attention on the changes to maximum residue levels (MRLs) for two quaternary ammonium compounds (QACs) which are used as disinfectants/sanitisers in the food industry. A member commented that the food industry has raised concerns that this may have implications for food hygiene and safety. Members agreed that it was timely to give this issue some thought now and revisit it at a future meeting. Prof O'Brien suggested that the Committee may have to set up a subgroup to carefully examine the areas of concern when this subject is formally brought to ACMSF.
- 137. At the public questions and answers session Mr Peter Littleton, Technical Director of Klenzan, a manufacturer of detergents used in catering and food processing environments, also a member of the Chilled Food Association's Biocides Working Group commented that there was great anxiety in the industry about the possible changes to plant protection product MRLs. He said there was a real risk to the microbiological integrity of food in catering and prepared food market where there were Listeria risks. There has been a drop in the sales of some QACs over the last year or so, with customers switching to other products because of a misunderstanding that QACs were banned. He highlighted various problems: some alternative disinfectants were unsuitable for food processing environments; there were restrictions because of Biocide Products Regulations; the cost of producing new biocides. He encouraged the Committee to engage with the Chilled Food Association and to raise the issue with EFSA because of the risk to the microbiological safety of food.

Collaboration with FSA's Social Science Research Committee

138. Members noted information paper ACM/1201 and welcomed the collaboration with the Social Science Research Committee. Two ACMSF members (Rosie Glazebrook and David Nuttall) volunteered to join the SSRC's Food and You working group to help inform future waves of the survey.

ACMSF Working and Ad Hoc Groups

Antimicrobial Resistance Working Group

- 139. The Antimicrobial Resistance Working Group met four times in 2015. The key issues they considered include:
 - UK Antimicrobial Resistance Strategy. Implementation of the action plan had been delayed by the House of Commons Science and Technology Committee deliberations on AMR. The group discussed the challenges in tackling issues relating to AMR in the past 20 years.
 - The European Medicines Agency Antimicrobial Expert Group (AMEG) Report. The group discussed AMEG's report and responded to questions on the impact of antibiotic usage and antimicrobial resistance in veterinary medicine which had been posed by the European Commission (EC).
 - A report on the Comparative Analysis of ESBL-producing *E. coli* isolates from animals and humans from the UK, the Netherlands and Germany. The group consider this study that investigated the genetic relatedness of ESBL/AmpC-producing *E. coli* from animals and humans from the UK, the Netherlands and Germany. Members endorsed the conclusion that stated that approaches to minimize human-to-human transmission are essential for controlling the spread of ESBL-positive *E. coli*.
 - Current issues relating to MRSA in the food chain (such as the detection of LA-MRSA in a piglet in Northern Ireland, the report produced by University of Salford and PHE on the identification of livestock-associated MRSA ST9 in retail meat in England). The group noted that the Defra Antimicrobial Resistance Coordination (DARC) Group is monitoring the issue of MRSA in the food chain. The DARC surveillance group are considering future surveillance options in relation to LA-MRSA with potential options being people who are in contact with animals (farmers, farm workers and practising veterinarians) as they were more likely to be sensitive markers on whether LA-MRSA is transferred to people.
 - The FSA's draft Risk Assessment on LA-MRSA in the food chain.
 - The FSA's proposal to commission a formal broad-based systematic/extensive literature review on the contribution food makes to the problem of AMR in humans. The group indicated that review should be a follow on from the 1999 ACMSF report and in particular should incorporate recent findings from countries outside the UK.

- The findings of the study on the prevalence of *Salmonella* Genomic Island 1 variants in human and animal *Salmonella* Typhimurium DT104. The study was a comprehensive coverage of a global zoonotic pathogen that demonstrated the differences between resistant *Salmonella* Typhimurium DT104 in human and animal population during the epidemics that occurred in Scotland.
- The group received a presentation on the Joint Interagency Antimicrobial Consumption and Resistance Analysis final report¹ (published on 30 January 2015).
- The preliminary analysis (presented by PHE) from the Department of Health's study on ESBL *E.coli*: Quantifying ESBL-positive *E. coli* in retail raw meat & fresh produce in the UK (a DH Study partly funded by the FSA). Study report is expected to be published in summer 2016.
- The issue of AMR and Environmental Reservoirs was provided through a presentation from Cefas (Centre for Environment, Fisheries and Aquaculture).
- Intermingled *Klebsiella pneumoniae* Populations Between Retail Meats and Human Urinary Tract Infections. The group considered the finding of this study so as to better understand potential contributions of foodborne *K. pneumoniae* to human clinical infections. This study compared *K. pneumoniae* isolates from retail meat products and human clinical specimens to assess their similarity based on antibiotic resistance, genetic relatedness, and virulence.
- Veterinary Medicines Research and Development and Surveillance Programme and other relevant issues relating to AMR in the food chain.
- UK One Health Report (Joint report on human and animal antibiotic use, sales and resistance, 2013). Members discussed this report (published by PHE) that brings together the most recently available UK data on antibiotic resistance in key bacteria that are common to animals and humans and details the amount of antibiotics sold for animal health and welfare and antibiotics prescribed to humans.
- FSA's risk assessment in relation to colistin resistance in *Salmonella* and *E. coli* in pigs in the UK (Enterobacteriaceae from UK pigs carrying the *mcr-1* colistin resistance gene). The subgroup considered the FSA's assessment of the current level of risk and uncertainty associated with the finding of the *mcr-1* gene for colistin

¹ http://ecdc.europa.eu/en/publications/Publications/antimicrobial-resistance-JIACRA-report.pdf

resistance in *Salmonella* Typhimurium var Copenhagen and *E. coli* in UK pigs.

• Activities of the Defra AMR Coordination Group (this is a standard item on the group's agenda)

Summaries of the above meetings are available on the ACMSF webpage at: <u>http://acmsf.food.gov.uk/acmsfsubgroups/amrwg</u>

Surveillance Working Group

- 140. The Surveillance Working Group provides advice as required in connection with the FSA's microbiological food surveillance programme and any other surveillance relevant to foodborne disease. During the year the group reviewed the FSA's amended sampling protocol for years 2, 3, 4 of the *Campylobacter* retail survey. The group discussed the protocol and the suggested amendments it had made to determine whether their questions had been satisfactorily addressed by the FSA.
- 141. The group also reviewed the draft final report of the year 1 *Campylobacter* retail survey and agreed that the report was generally of good quality and that the investigators have developed and delivered an appropriately robust project that has been well-executed and reported. The final report was published on 10 September 2015.

Ad Hoc Group on Eggs

- 142. The subgroup on Eggs established in January 2015 met four times in 2015. The group's first meeting was held on 24 February and their main focus was to determine terms of reference, scope of work and outputs of the group.
- 143. At the second meeting held on 30 April the group discussed an outline of the sections of the report they would be produce and agreed to include the following areas:
 - An introduction giving the background, remit and scope of the group's work
 - Changes in epidemiology of *Salmonella* and egg associated infections
 - Identification of all microbiological hazards associated with eggs and the egg products listed within the scope of the group. Pathogen specificity for eggs from different sources
 - Consumption patterns relating to different egg types and products in the UK
 - Relevant legislation and changes since 2001
 - Storage, handling and use of eggs in the catering industry

- Description of interventions relating to laying hens, chickens, ducks, quails and any other at primary production
- Other interventions and the scientific robustness of these interventions
- Data on the level of contamination of all eggs
- Revisiting the risk assessment model. Have all the data gaps identified in 2001 been filled?
- Consideration of all *Salmonella* serotypes to identify potential threats and emerging problems e.g. vaccination against emerging pathogens
- Importance of epidemiology and surveillance going forward.
- 144. The group's third and fourth meetings held in October and November were used to consider and finalise their draft final report. Report is expected to be presented to the full Committee for endorsement to go to public consultation at the January 2016 plenary meeting.

Outcome and Impact of ACMSF advice

- 145. Feedback on the outcome of ACMSF recommendations are provided to the Committee through matters arising papers, information papers and oral updates at meetings. In 2015 the Committee considered a range of issues which may have an impact on risk management.
- 146. In March 2015 the *Ad Hoc* Group on Foodborne Viral Infections produced a report on viruses in the food chain (Update on viruses in the food chain). Report considered the most important viruses associated with foodborne viral infections; norovirus, hepatitis A virus and hepatitis E virus. The Committee consulted key stakeholders during the production of the report to ensure that the latest science, surveillance and data were available to inform their deliberations and evidence gathering. Key recommendations include the need for more research to improve understanding in certain areas (such as foodborne viral disease and contamination of food through sewage contamination) and to improve consumer awareness of the risks. The recommendations provided an impetus for an FSA/EFSA workshop on foodborne viruses (norovirus, hepatitis A and E) held in February 2016.
- 147. The FSA sought the Committee views on the risk from Shiga toxin producing *E.coli* (STEC) in raw and ready-to-eat foods to support decision making regarding the safety of these products. Risk assessment had been presented to the Committee to consider. Comments made by the Committee were taken into account in determining the current level of risk from STEC.
- 148. The Committee was asked to revisit the assessment of the risk of avian influenza viruses via the food chain following a number of recent outbreaks on poultry farms in the UK. An up-to-date risk assessment

which took into account more recent data, including global outbreaks was considered by the Committee. Members agreed with the assessment that the overall health risk related to avian influenza viruses via food chain was very low. The Committee remarks were taken into account to revise the FSA's updated risk assessment on the risk of avian influenza viruses via the food chain.

- 149. The FSA asked the Committee to provide comments on the risk assessment (carried out by APHA) for the use of *Mycobacterium bovis* BCG Danish Strain 1331 in cattle: risks to public health. The risk assessment was specifically on the safety of meat and milk from vaccinated animals. ACMSF's views were used to inform a decision on whether meat/milk from vaccinated animals can enter the food chain.
- 150. The Committee gave its views on the food safety implications of the use of recycled manure solids used as bedding for dairy cattle. Members were informed that reduced availability and increasing cost of more traditional bedding materials, had over a period of time led to the use of RMS as bedding for dairy cattle on a limited number of farms across the UK. ACMSF's views were taken into account by the FSA in formulating its position on this practice.
- 151. ACMSF's Surveillance Working Group considered the final report of the FSA's microbiological survey of *Campylobacter* contamination in fresh whole UK produced chilled chickens at retail (that was concluded in February 2015) and protocols for the next survey that started in July 2015. Advice provided on the survey report together with comments on the ongoing survey were taken into account by the FSA.
- 152. The Committee's AMR Working Group whose remit is to assess the risks to humans from foodborne transmission of antimicrobial-resistant microorganisms and provide advice to the FSA considered a range of issues brought to them by the Agency in 2015. Subgroup's comments were taken into account on a range of issues brought to the members to consider such as:
 - The Agency's systematic literature review to assess the significance of the food chain in the context of antimicrobial resistance.
 - MRSA in the food chain including the FSA's risk assessment for LA-MRSA in the food chain
 - Study on extended-spectrum β-lactamase (ESBL) *Escherichia coli*: Quantifying ESBL-positive *E. coli* in retail raw meat & fresh produce in the UK
 - European Medicines Agency Antimicrobial Expert Group's request for scientific advice on the impact on public health and animal health of the use of antibiotics in animals

• The issue of colistin resistance in *Salmonella* and *E. coli* in pigs in the UK. The subgroup considered the FSA's assessment of the current level of risk and uncertainty associated with the finding of the *mcr-1* gene for colistin resistance in *Salmonella* Typhimurium var Copenhagen and *E. coli* in UK pigs.

ACMSF Involvement in Incidents and Outbreaks

153. In December the FSA sought the Committee's views on the microbiological risk assessment relating to a chilled pasteurised crab incident. The ACMSF Chair and a small group of Members commented on the risk assessment report as comments were required urgently and outbreak investigations were ongoing.

Information papers

154. The ACMSF is routinely provided with information papers on topics which the Secretariat considers may be of interest to Members. This affords them the opportunity to identify particular issues for discussion at future meetings. Among the documents provided for information during 2015 were:

NO. OF PAPER	NAME OF PAPER	MEETING NUMBER	DATE OF MEETING
ACM/1172	Update from other Scientific Advisory Committees	84 th	29 January 2015
ACM/1173	ACMSF Work plan	84 th	29 January 2015
ACM/1174	Items of interes from the literature	84 th	29 January 2015
ACM/1175	Report of the 46 th Codex Committee on Food Hygiene	84 th	29 January 2015
ACM/1176	Recent EFSA reports and opinions	84 th	29 January 2015
ACM/1186	Update from other Scientific Advisory Committees	85 th	25 June 2015
ACM/1187	ACMSF Work plan	85 th	25 June 2015

ACM/1188	Listeria in cooked sliced meat – a Review of current practices	85 th	25 June 2015
ACM/1189	Items of interest from the literature	85 th	25 June 2015
ACM/1195	Progress report on ACMSF recommendations	86 th	1 October 2015
ACM/1196	FSA Board paper – Framework for risky foods and its application to burgers	86 th	1 October 2015
ACM/1197	Changes to plant protection product MRLs: potential impact on food safety	86 th	1 October 2015
ACM/1198	ACMSF Work plan	86 th	1 October 2015
ACM/1199	Update from other Scientific Advisory Committees	86 th	1 October 2015
ACM/1200	Items of interest from the literature	86 th	1 October 2015
ACM/1201	Collaboration with Social Science Research Committee	86 th	1 October 2015

Chapter 3: A Forward Look

Future work programme

- 155. The Committee will keep itself informed of developing trends in relation to foodborne disease through its close links with the FSA and Public Health England. We will continue to respond promptly with advice on the food safety implications of issues referred to the Committee by the FSA.
- 156. The *Ad Hoc* Group on Eggs set up to update the Committee's assessment of the risks to consumers, including vulnerable groups, from eating lightly cooked raw shell eggs and their products are working towards publishing their report by Spring 2016.
- 157. The Committee through its Working Group on Antimicrobial Resistance will continue to assess the risks to humans from foodborne transmission of antimicrobial-resistant microorganisms and provide advice to the FSA.
- 158. The Committee, through its standing Surveillance Working Group, will continue to provide advice as required in connection with the Government's microbiological food surveillance programme and any other surveillance relevant to foodborne disease.
- 159. The Working Group on emerging pathogens will keep a watching brief on developments concerning the risks to human health from newly emerging or re-emerging pathogens through food chain exposure pathways.
- 160. As *Campylobacter* in chicken is a strategic priority for the FSA, the Committee will setup a subgroup to evaluate the outcomes to date from the second report on *Campylobacter* and produce a report to advise the FSA in its strategy for reducing foodborne illness in relation to *Campylobacter*.
- 161. Details of the Committee's work plan for 2015/16 can be found at Annex II.

Papers Considered by ACMSF in 2015

NO. OF PAPER	NAME OF PAPER	MEETING NUMBER	DATE OF MEETING
ACM/1163	Matters arising	84 th	29 January 2015
ACM/1164	Update on viruses in the food chain	84 th	29 January 2015
ACM/1165	Food safety risk of recycled manure solids used as bedding for dairy cattle	84 th	29 January 2015
ACM/1166	Risk assessment of <i>Salmonella</i> from shell eggs	84 th	29 January 2015
ACM/1167	Food and You Survey: Findings from Wave 3	84 th	29 January 2015
ACM/1168	A microbiological survey of pre-packed ready-to-eat sliced meats at retail in UK small to medium sized enterprises	84 th	29 January 2015
ACM/1169	Epidemiology of Foodborne Infections Group	84 th	29 January 2015
ACM/1170	Antimicrobial Resistance Working Group	84 th	29 January 2015
ACM/1171	Dates of future meetings	84 th	
ACM/1172	Update from other Scientific Advisory Committees	84 th	29 January 2015
ACM/1173	ACMSF Work plan	84 th	29 January 2015
ACM/1174	Items of interest from the literature	84 th	29 January 2015

ACM/1175	Report of the 46 th Codex Committee on Food Hygiene	84 th	29 January 2015
ACM/1176	Recent EFSA reports and opinions	84 th	29 January 2015
ACM/1177	Matters arising	85 th	25 June 2015
ACM/1178	Output from horizon scanning workshop	85 th	25 June 2015
ACM/1179	Initial response to the ACMSF virus report	85 th	25 June 2015
ACM/1180	Campylobacter <i>Retail</i> Survey	85 th	25 June 2015
ACM/1181	Risk assessment for the use of <i>Mycobacterium</i> <i>bovis</i> BCG Danish Strain 1331 in Cattle: Risks to public health	85 th	25 June 2015
ACM/1182	Epidemiology of Foodborne Infections Group	85 th	25 June 2015
ACM/1183	Antimicrobial Resistance Working Group	85 th	25 June 2015
ACM/1184	Ad Hoc Group on Eggs	85 th	25 June 2015
ACM/1185	Dates of future meetings	85 th	25 June 2015
ACM/1186	Update from other Scientific Advisory Committees	85 th	25 June 2015
ACM/1187	ACMSF Work plan	85 th	25 June 2015
ACM/1188	Listeria in cooked sliced meat – a Review of current practices	85 th	25 June 2015
ACM/1189	Items of interest from the literature	85 th	25 June 2015
ACM/1190	Matters arising	86 th	1 October 2015

ACM/1191	Shiga toxin producing <i>E.coli</i> (STEC) in food	86 th	1 October 2015
ACM/1192	Assessment of the risk of avian influenza viruses via the food chain	86 th	1 October 2015
ACM/1193	Histamine in cheese	86 th	1 October 2015
ACM/1194	Dates of future meetings	86 th	1 October 2015
ACM/1195	Progress report on ACMSF recommendations	86 th	1 October 2015
ACM/1196	FSA Board paper – Framework for risky foods and its application to burgers	86 th	1 October 2015
ACM/1197	Changes to plant protection product MRLs: potential impact on food safety	86 th	1 October 2015
ACM/1198	ACMSF Work plan	86 th	1 October 2015
ACM/1199	Update from other Scientific Advisory Committees	86 th	1 October 2015
ACM/1200	Items of interest from the literature	86 th	1 October 2015
ACM/1201	Collaboration with Social Science Research Committee	86 th	1 October 2015

Annex II

ACMSF Forward Work Plan 2014/15

This work plan shows the main areas of ACMSF's work over the next 12 to 18 months. It should be noted that the Committee must maintain the flexibility to consider urgent issues that arise unpredicted and discussions scheduled in the work programme may therefore be deferred.

	Торіс	Progress	Expected Output
1	Horizon scanning		
	 The ACMSFs last horizon scanning exercise resulted in the establishment of a subgroup to consider the microbiological risks associated with raw, rare and low temperature cooked foods. The subgroup's paper on this topic was published at the October 2013 ACMSF meeting. Paper was slightly updated and provided to members in June 2014. A new horizon scanning exercise to identify potential topics and emerging microbiological risks will be taken forward. 	Horizon scanning activity to be held by January 2015.	Short-listed priorities for horizon scanning topics.
2	Foodborne Viral Infections	<i>The Ad Hoc</i> Group on Foodborne Viral Infections presented a draft	An ACMSF report on foodborne viral infections highlighting risks to
		version of their report to the Committee in October 2013.	consumers and identifying any research and surveillance gaps.

	Торіс	Progress	Expected Output
		Members submitted written comments on the report and the prioritisation of recommendations. The Committee approved the draft final report for public consultation in January 2014. Consultation comments and revised report to be presented to the Committee in October 2014.	Report and recommendations will be forwarded to the FSA.
3	Newly Emerging Pathogens The Newly Emerging Pathogens Working Group provides advice on the significance and risk from newly emerging or re-emerging pathogens through food chain exposure pathways.	Continuous.	The Committee to draw the FSA's attention to any risk to human health from newly emerging pathogens via food.
4	Microbiological Surveillance of food The Surveillance Working Group provides advice as required in connection with the FSA's microbiological food surveillance programme and any other surveillance relevant to foodborne disease.	Working group activities are continuous. Committee to consider the FSAs survey on <i>Listeria</i> in cooked-sliced meat at its October 2014 meeting. Committee to consider results of UK-wide microbiological monitoring of slaughter pigs at the June 2014 meeting.	Surveillance Working Group/Committee comments on survey protocols and survey results for consideration by FSA in their microbiological food surveillance programme.

	Торіс	Progress	Expected Output
5	Developing trends in relation to foodborne disease The Committee receives updates on research, surveys, investigations, meetings and conferences of interest.	As issues arise EFIG ² updates will be provided at the January and June 2014 meetings. The results of research to estimate the burden of foodborne disease will be presented to the Committee in June 2014.	ACMSF comments on the updates it receives for the FSA's consider- ation.
6	International and EU developments on the microbiological safety of food The Committee is updated on issues of relevance and significant developments at an EU and international level on microbiological food safety, such as EFSA opinions and Codex Committee on Food Hygiene meetings.	As issues arise.	ACMSF to note updates and provide comments if desired.
7	Microbiological Incidents and outbreaks The views of the Committee will be sought where necessary and updates provided on outbreaks of significance.	As issues arise.	ACMSF assessment of the risks in relation to significant microbiological outbreaks/incidents.

² Epidemiology of Foodborne Infections Group

	Торіс	Progress	Expected Output
8	Actimicrobial resistance ACMSF published a report on microbial antibiotic resistance in relation to food safety in 1999. Progress on the Committees recommendations was reviewed in 2005 and 2007.	The Committee were updated on developments and emerging issues in relation to antimicrobial resistance in January 2013 and agreed to set up a subgroup to consider antimicrobial resistance and food chain issues in more detail. The subgroup has met four times and summaries of their discussions and recommendations are provided at the subsequent Committee meeting.	ACMSF assessment of the key risks to the food chain which may have consequences for human health and identification of key research or surveillance gaps in relation to the food chain.
9	<i>Mycobacterium bovis</i> and possible health risks associated with meat	The Committee will be asked to review the risk level classification for health risk associated with the consumption of meat from animals with evidence of <i>M. bovis</i> infection. Committee to use the <i>M.bovis</i> and raw milk risk assessment framework. Uncertainties are to be highlighted before risk classification is considered.	ACMSF assessment of risk to human health in relation to the consumption of meat from animals with evidence of <i>M.bovis</i> infection.

10	Social science research relating to microbiological food safety risks	The Committee will receive updates on the findings of social science research which may have a bearing on the assessment of microbiological food safety risks. Committee to consider findings from the recent FSA research on domestic kitchen practices at their June 2014 meeting.	ACMSF to note updates and provide comments if desired.
11	Microbiological risks from shell eggs	The Committee to assess risks associated with egg consumption at either their October 2014 or January 2015 meeting.	ACMSF's assessment of the risks that may be associated with egg consumption.
12	Bovine Tuberculosis (TB) vaccination field trials	AHVLA to carry out a risk assessment on the safety of meat and milk from vaccinated animals participating in the field trial. The Committee will receive information on the proposed risk assessment (at the June 2014 meeting) and will be asked to comment on the risk assessment when it is completed later in 2014.	ACMSF's views will be used to inform a decision on whether meat/milk from vaccinated animals can enter the food chain.

Annex III

Terms of Reference and Membership of the Advisory Committee on the Microbiological Safety of Food, its Working Groups and its *Ad Hoc* Groups

Terms of reference

<u>ACMSF</u>

To assess the risk to humans from 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.

Surveillance Working Group

To facilitate the provision of ACMSF advice to government in connection with its microbiological food surveillance programme and other surveillance relevant to foodborne disease, particularly in relation to the design, methodology, sampling and statistical aspects; and to report back regularly to the ACMSF.

Newly Emerging Pathogens Working Group

To assemble information on the current situation on this topic in order to decide whether there is a potential problem in relation to the microbiological safety of food; and to recommend to the ACMSF whether the Committee needs to undertake further action.

Antimicrobial Resistance Working Group

- To brief ACMSF on developments in relation to antimicrobial resistance and the food chain and identify evidence that will assist the group in assessing the risks.
- To review key documents and identify the risks for the UK food chain and relevant aspects of the feed chain in relation to antimicrobial resistance which may have consequences for human health.
- To comment on progress in understanding the issue of antimicrobialresistant microorganisms and the food chain since the ACMSF produced its report in 1999 and subsequent reviews in 2005 and 2007, including the relevance of any outstanding recommendations.
- To highlight key research or surveillance gaps in relation to antimicrobial-resistant microorganisms and the food/feed chain and identify those which are considered a priority.

Ad Hoc Group on Eggs

- To assess the current level of microbiological risk to consumers (including vulnerable groups) from raw or lightly cooked shell eggs and their products.
- To assess how the risk with respect to *Salmonella* has changed since the last ACMSF report on this subject in 2001.

The working group will report back regularly to the ACMSF.

Membership Tables

		ACMSF	Surveillance Working Group	Newly Emerging Pathogens Working Group	<i>Ad Hoc</i> Group on Eggs	AMR Working Group
Chair						
Professor S J O'Brien	Professor of Infection Epidemiology and Zoonoses, University of Liverpool, Institute of Infection and Global Health, National centre for Zoonosis Research	~	✓	\checkmark		
Members						
Dr G Adak	Head of Gastrointestinal Infection Surveillance, Department of Gastrointestinal, Emerging & Zoonotic Infections, Health Protection Services Colindale	~	✓			
Dr G Barker	Senior Research Scientist, Institute of Food Research, Norwich	~		\checkmark	✓	
Dr R Betts	Head of Food Microbiology, Campden BRI	✓	~			
Mrs V Buller ³	Catering Adviser School Food Consultant Service Improvement Consultant	~				

³ Appointment ended 31 March 2015

		ACMSF	Surveillance Working	Newly Emerging Pathogens	Ad Hoc Group on	AMR Working
			Group	Working Group	Eggs	Group
Professor J Coia ⁴	Consultant Microbiologist, NHS Greater Glasgow and Clyde	✓	~		~	~
Mrs J Dobbs⁵	Member of the Social Science Research Committee	✓				
Mrs R Glazebrook	Consumer representative	✓			~	~
Professor J Gray ⁶	Consultant clinical scientist, Specialist Virology Centre, Norfolk and Norwich University Hospitals	√				
Professor M Iturriza-Gómara ⁷	Professor of Virology, University of Liverpool	✓				
Mr A Kyriakides ⁸	Head of Product Quality, Safety and Supplier Performance, Sainsburys	~				

 ⁴ Chair of Surveillance Working Group and *Ad Hoc* Group on Eggs
 ⁵ *Ex officio* appointment (Member of Social Science Research Committee)
 ⁶ Appointment ended 31 March 2015
 ⁷ Appointed 1 April 2015
 ⁸ Appointed 1 April 2015

		ACMSF	Surveillance	Newly Emerging	Ad Hoc	AMR
			Working	Pathogens	Group on	Working
			Group	Working Group	Eggs	Group
Professor R E	PHE Lead Public Health	✓		✓	✓	\checkmark
Holliman ⁹	Microbiologist for London.					
	Professor of Public Health Micro-					
	biology, St George's, University					
	of London. Consultant in Clinical					
	Microbiology, at St George's,					
	Barts & the Royal London					
	Hospitals					
Ms J Hopwood ¹⁰	Company Microbiologist, Marks &	✓	\checkmark			
	Spencer					
Professor P	Microbiologist and Microbiology	✓	\checkmark			
McClure	Department Manager,					
	Mondelēz International R&D Ltd					
Professor D	Professor of Food Studies	✓	\checkmark	✓	✓	✓
McDowell	University of Ulster					
Dr S Millership	Consultant in Communicable	✓				
	Disease Control, Essex Health					
	Protection Unit and Consultant in					
	Microbiology, Princess Alexandra					
	Hospital, Harlow					

⁹ Chair of Newly Emerging Pathogens Group ¹⁰ Appointment ended 31 March 2015

		ACMSF	Surveillance Working Group	Newly Emerging Pathogens Working Group	<i>Ad Hoc</i> Group on Eggs	AMR Working Group
Mrs J Morris	Principal Policy Officer (Food), Chartered Institute of Environmental Health	~				
Mr D Nuttall	Catering Manager Harper Adams University College	~			~	
Dr D Tucker	Senior Lecturer in Veterinary Public Health/pig medicine, University of Cambridge	 Image: A start of the start of		~		
Co-opted Members						
Mr R Davies	Veterinary Advisor and Salmonella Consultant, Animal and Plant Health Authority				\checkmark	
Prof T Humphrey	Professor of Bacteriology and Food Safety, University of Swansea				\checkmark	
Mr C Lane	Public Health England				✓	
Ms L Larkin	Veterinary Adviser, Animal and Plant Health Authority				√	
Prof S Forsythe	Member of Advisory Committee on Animal Feedingstuffs (ACAF)					~
Mr C Teale	Animal Health and Veterinary Laboratories Agency					~
Prof J Threlfall	Formerly Health Protection Agency					~

		ACMSF	Surveillance Working Group	Newly Emerging Pathogens Working Group	Ad Hoc Group on Eggs	AMR Working Group
Departmental Representatives						
Dr Susanne Boyd	Food Standards Agency (Northern Ireland)	~				
Ms N Looch	Food Standards Agency				\checkmark	
Dr S Wellsteed	Department of Health					✓
Mr S Wyllie	Department for Environment, Food and Rural Affairs	~		✓		~
Scientific Secretary						
Dr P Cook	Food Standards Agency	✓				✓
Dr M Upadhyay	Food Standards Agency	✓	\checkmark	\checkmark	✓	
Mr A Hardgrave	Food Standards Agency		\checkmark			
Ms K Thomas	Food Standards Agency					✓
Administrative Secretariat						
Mr A Adeoye	Food Standards Agency	✓	\checkmark	\checkmark	✓	✓
Ms S Butler	Food Standards Agency	✓	\checkmark	✓	✓	✓

Annex IV

Advisory Committee on the Microbiological Safety of Food Register of Members' Interests

Member	Personal interests		Non-personal interests		
	Name of company	Nature of interest	Name of company	Nature of interest	
Professor S J O'Brien	None		Various	Research funding in collaboration with industrial partners FSA funded research	
Dr G Adak	None		None		
Dr G Barker	None		Various	Research Funding in collaboration with industrial partners	
Dr R Betts	Campden Group Services	Employee	A range of food producers/providers and associated service industries	Work for Campden BRI's members	
Mrs V Buller	Local Authorities, Schools & Food Service Organisations LACA (Lead Association for Catering in Education) APSE (Association for Public Service Excellence)	Catering Adviser & Food Service Consultant Honorary Past National Chair Regional Secretary Associate Consultant	Various	Consultancy Interim Project Management	

Member	Personal interests		Non-personal interests		
	Name of company	Nature of interest	Name of company	Nature of interest	
Professor J Coia	Tesco UK	Ad Hoc medico-legal work on infection related matters Consultancy work	Various	Funding for research projects	
Mrs R Glazebrook	None		None		
Professor R E Holliman	Public Health England St George's, University of London	Employee Employee	None		
Mr J Hopwood	Marks & Spencer plc BRC Micro Working Group Campden BRI Governance Research Committee	Employee Member Member	None		

Member	Personal interests		Non-personal interests		
	Name of company	Nature of interest	Name of company	Nature of interest	
Professor D McDowell	University of Ulster	Employee	Companies in food processing/retail	Consultancy/Research funding with industry	
	Institute	Deputy Chair	FSA	Participation in the preparation of a research proposal, in collaboration with Ipsos MORI - Domestic Kitchen Practices FS244026. Consultancy report on reusable plastic bags – in collaboration with British Hospitality Association	
Dr S Millership	None		None		
Mrs J Morris	Chartered Institute of Environmental Health	Employee and Member	None		
Mr D Nuttall	Harper Adams University College	Catering Manager	None		

Member	Personal interests		Non-personal interests		
	Name of company	Nature of interest	Name of company	Nature of interest	
Ad Hoc Group on					
Eggs					
Mr R Davies			British Egg Industry Council and individual egg producers	Adviser	
			European Food Safety Authority	Member of Working Group on hatching eggs	
Prof T Humphrey	British Egg Industry Council	Consultant			
	McDonalds	Consultant			
Ms Lesley Larkin	None		None		
Antimicrobial					
Resistance					
Working Group					
Professor S	None		None		
Forsythe					
Mr C Teale	None		None		
Prof J Threlfall	None		None		

Annex V

CODE OF PRACTICE FOR MEMBERS OF THE ADVISORY COMMITTEE ON THE MICROBIOLOGICAL SAFETY OF FOOD

Public service values

The members of the Advisory Committee on the Microbiological Safety of Food must at all times

• observe the highest standards of **impartiality**, **integrity and objectivity** in relation to the advice they provide and the management of this Committee;

• be accountable, through the Food Standards Agency (the Agency) and, ultimately, Ministers, to Parliament and the public for the Committee's activities and for the standard of advice it provides.

The Ministers of the sponsoring department (the Agency) are answerable to Parliament for the policies and performance of this Committee, including the policy framework within which it operates.

Standards in public life

All Committee members must:

• follow the Seven Principles of Public Life set out by the Committee on Standards in Public Life (Appendix 1);

• comply with this Code, and ensure they understand their duties, rights and responsibilities, and that they are familiar with the functions and role of this Committee and any relevant statements of Government policy. If necessary, members should consider undertaking relevant training to assist them in carrying out their role;

• not misuse information gained in the course of their public service for personal gain or for political purpose, nor seek to use the opportunity of public service to promote their private interests or those of connected persons, firms, businesses or other organizations; and

• not hold any paid or high-profile unpaid posts in a political party, and not engage in specific political activities on matters directly affecting the work of this Committee. When engaging in other political activities, Committee members should be conscious of their public role and exercise proper discretion. These restrictions do not apply to MPs (in those cases where MPs are eligible to be appointed), to local councillors, or to Peers in relation to their conduct in the House of Lords.

Role of Committee members

Members have collective responsibility for the operation of this Committee. They must:

• engage fully in collective consideration of the issues, taking account of the full range of relevant factors, including any guidance issued by the Agency;

• ensure that they adhere to the Agency's Code of Practice on Openness (including prompt responses to public requests for information); agree an Annual Report; and, where practicable and appropriate, provide suitable opportunities to open up the work of the Committee to public scrutiny;

- follow Agency guidelines on divulging any information provided to the Committee in confidence;
- ensure that an appropriate response is provided to complaints and other correspondence, if necessary with reference to the Agency; and
- ensure that the Committee does not exceed its powers or functions.

Individual members should inform the Chair (or the Secretariat on his behalf) if they are invited to speak in public in their capacity as a Committee member.

Communications between the Committee and the Agency will generally be through the Chair except where the Committee has agreed that an individual member should act on its behalf. Nevertheless, any member has the right of access to the Chair of the Agency on any matter which he or she believes raises important issues relating to his or her duties as a Committee member. In such cases, the agreement of the rest of the Committee should normally be sought.

Individual members can be removed from office by the Chair of the Agency if, in the view of the Chair of the Agency, they fail to carry out the duties of office or are otherwise unable or unfit to carry out those duties.

The role of the Chair

The Chair has particular responsibility for providing effective leadership on the issues above. In addition, the Chair is responsible for:

• ensuring that the Committee meets at appropriate intervals, and that the minutes of meetings and any reports to the Agency accurately record the decisions taken and, where appropriate, the views of individual members; • representing the views of the Committee to the general public, notifying and, where appropriate, consulting the Agency, in advance where possible; and

• ensuring that new members are briefed on appointment (and their training needs considered), and providing an assessment of their performance, on request, when members are considered for re-appointment to the Committee or for appointment to the board of some other public body.

DEPARTMENTAL ASSESSORS AND THE SECRETARIAT

Departmental assessors

Meetings of the ACMSF and its Groups are attended by Departmental Assessors. The Assessors are currently nominated by, and are drawn from, those with relevant policy interests and responsibilities in the Food Standards Agency (including FSA Northern Ireland and Wales), and the Department for Environment, Food and Rural Affairs. Assessors are not members of the ACMSF and do not participate in Committee business in the manner of members. The role of the Assessors includes sharing with the secretariat the responsibility of ensuring that information is not unnecessarily withheld from the Committee. Assessors should make the Committee aware of the existence of any information that has been withheld from the Committee on the basis that it is exempt from disclosure under Freedom of Information legislation unless that legislation provides a basis for not doing so. Assessors keep their parent Departments informed about the Committee's work and act as a conduit for the exchange of information; advising the Committee on relevant policy developments and the implications of ACMSF proposals; informing ACMSF work through the provision of information; and being informed by the Committee on matters of mutual interest. Assessors are charged with ensuring that their parent Departments is promptly informed of any matters which may require a response from Government.

The Secretariat

The primary function of the Secretariat is to facilitate the business of the Committee. This includes supporting the Committee by arranging its meetings, assembling and analysing information, and recording conclusions. An important task is ensuring that proceedings of the Committee are properly documented and recorded. The Secretariat is also a source of advice and guidance to members on procedures and processes.

The ACMSF Secretariat is drawn from staff of the Food Standards Agency. However, it is the responsibility of the Secretariat to be an impartial and disinterested reporter and at all times to respect the Committee's independent role. The Secretariat is required to guard against introducing bias during the preparation of papers, during meetings, or in the reporting of the Committee's deliberations.

Handling conflicts of interest

The purpose of these provisions is to avoid any danger of Committee members being influenced, or appearing to be influenced, by their private interests in the exercise of their public duties. All members should declare any personal or business interest which may, or may be *perceived* (by a reasonable member of the public) to, influence their judgement. A guide to the types of interest which should be declared is at Appendix 2.

(i) Declaration of Interests to the Secretariat

Members of the Committee should inform the Secretariat in writing of their current **personal** and **non-personal** interests (or those of close family members* and of people living in the same household), when they are appointed, including the principal position(s) held. Only the name of the company and the nature of the interest are required; the amount of any salary etc need not be disclosed. Members are asked to inform the Secretariat at any time of any change of their **personal** interests and will be invited to complete a declaration form once a year. It is sufficient if changes in **non-personal** interests are reported in the annual declaration form following the change. (Non-personal interests involving less than £1,000 from a particular company in the previous year need not be declared to the Secretariat).

The register of interests should be kept up-to-date and be open to the public.

(ii) Declaration of Interests and Participation at Meetings

Members of the Committee are required to declare any direct commercial interests, or those of close family members,^{*} and of people living in the same household, in matters under discussion at each meeting. Members should not participate in the discussion or determination of matters in which they have an interest, and should normally withdraw from the meeting (even if held in public) if:-

• their interest is direct and pecuniary; or

• their interest is covered in specific guidance issued by the ACMSF or the Agency which requires them not to participate in, and/or to withdraw from, the meeting.

^{*} Close family members include personal partners, parents, children, brothers, sisters and the personal partners of any of these.
Personal liability of Committee members

A Committee member may be personally liable if he or she makes a fraudulent or negligent statement which results in a loss to a third party; or may commit a breach of confidence under common law or a criminal offence under insider dealing legislation, if he or she misuses information gained through their position. However, the Government has indicated that individual members who have acted honestly, reasonably, in good faith and without negligence will not have to meet out of their own personal resources any personal civil liability which is incurred in execution or purported execution of their Committee functions.

Appendix 1

THE SEVEN PRINCIPLES OF PUBLIC LIFE

Selflessness

Holders of public office should take decisions solely in terms of the public interest. They should not do so in order to gain financial or other material benefits for themselves, their family, or their friends.

Integrity

Holders of public office should not place themselves under any financial or other obligation to outside individuals or organisations that might influence them in the performance of their official duties.

Objectivity

In carrying out public business, including making public appointments, awarding contracts, or recommending individuals for rewards and benefits, holders of public office should make choices on merit.

Accountability

Holders of public office are accountable for their decisions and actions to the public and must submit themselves to whatever scrutiny is appropriate to their office.

Openness

Holders of public office should be as open as possible about all the decisions and actions that they take. They should give reasons for their decisions and restrict information only when the wider public interest clearly demands.

Honesty

Holders of public office have a duty to declare any private interests relating to their public duties and to take steps to resolve any conflicts arising in a way that protects the public interests.

Leadership

Holders of public office should promote and support these principles by leadership and example.

Appendix 2

DIFFERENT TYPES OF INTEREST

The following is intended as a guide to the kinds of interest which should be declared. Where members are uncertain as to whether an interest should be declared, they should seek guidance from the Secretariat or, where it may concern a particular product which is to be considered at a meeting, from the Chair at that meeting. If members have interests not specified in these notes, but which they believe could be regarded as influencing their advice, they should declare them. However, neither the members nor the Secretariat are under any obligation to search out links of which they might *reasonably* not be aware - for example, either through not being aware of all the interests of family members, or of not being aware of links between one company and another.

Personal Interests

A personal interest involves the member personally. The main examples are:

• **Consultancies:** any consultancy, directorship, position in or work for the industry, which attracts regular or occasional payments in cash or kind;

• **Fee-Paid Work:** any work commissioned by industry for which the member is paid in cash or kind;

• **Shareholdings:** any shareholding or other beneficial interest in shares of industry. This does not include shareholdings through unit trusts or similar arrangements where the member has no influence on financial management;

• **Membership or Affiliation** to clubs or organisations with interests relevant to the work of the Committee.

Non-Personal Interests

A non-personal interest involves payment which benefits a department for which a member is responsible, but is not received by the member personally. The main examples are:

• Fellowships: the holding of a fellowship endowed by the industry;

• **Support by Industry:** any payment, other support or sponsorship by industry which does not convey any pecuniary or material benefit to a member personally, but which does benefit their position or department e.g.

(i) a grant from a company for the running of a unit or department for which a member is responsible;

(ii) a grant or fellowship or other payment to sponsor a post or a member of staff in the unit for which a member is responsible (this does not include financial assistance to students);

(iii) the commissioning of research or other work by, or advice from, staff who work in a unit for which a member is responsible.

Members are under no obligation to seek out knowledge of work done for, or on behalf of, industry by departments for which they are responsible if they would not normally expect to be informed. Where members are responsible for organisations which receive funds from a large number of companies involved in that industry, the Secretariat can agree with them a summary of non-personal interests rather than draw up a long list of companies.

• **Trusteeships:** any investment in industry held by a charity for which a member is a trustee.

Where a member is a trustee of a charity with investments in industry, the Secretariat can agree with the member a general declaration to cover this interest rather than draw up a detailed portfolio.

DEFINITIONS

For the purpose of the Advisory Committee on the Microbiological Safety of Food, 'industry' means:

• Companies, partnerships or individuals who are involved with the production, manufacture, packaging, sale, advertising, or supply of food or food processes, subject to the Food Safety Act 1990;

• Trade associations representing companies involved with such products;

• Companies, partnerships or individuals who are directly concerned with research, development or marketing of a food product which is being considered by the Committee

In this Code, 'the Secretariat' means the Secretariat of the Advisory Committee on the Microbiological Safety of Food.

Annex VI

GOOD PRACTICE GUIDELINES FOR THE INDEPENDENT SCIENTIFIC ADVISORY COMMITTEES

PREAMBLE

Guidelines 2000: Scientific Advice and Policy Making¹¹ set out the basic principles which government departments should follow in assembling and using scientific advice, thus:

- think ahead, identifying the issues where scientific advice is needed at an early stage;
- get a wide range of advice from the best sources, particularly where there is scientific uncertainty; and
- publish the scientific advice they receive and all the relevant papers.

The Code of Practice for Scientific Advisory Committees¹² (revised in December 2007) provided more detailed guidance specifically focused on the operation of scientific advisory committees (SACs). The Agency subsequently commissioned a Report on the Review of Scientific *Committees*¹³ to ensure that the operation of its various advisory committees was consistent with the remit and values of the Agency, as well as the Code of Practice.

The Food Standards Agency's Board has adopted a Science Checklist (Board paper: FSA 06/02/07) to make explicit the points to be considered in the preparation of papers dealing with science-based issues which are either assembled by the Executive or which draw on advice from the Scientific Advisory Committees.

Guidelines on Scientific Analysis in Policy Making, OST, October 2005. Guidelines 2000: Scientific advice and policy-making. OST July 2000 ¹² Code of Practice for Scientific Advisory Committees, OST December 2001

¹³ Report on the Review of Scientific Committees, FSA, March 2002

The Board welcomed a proposal from the Chairs of the independent SACs to draw up Good Practice Guidelines based on, and complementing, the Science Checklist.

THE GOOD PRACTICE GUIDELINES

These Guidelines have been developed by 9 advisory committees:

These committees share important characteristics. They:

- \succ are independent;
- work in an open and transparent way; and
- > are concerned with risk assessment not risk management.

The Guidelines relate primarily to the risk assessment process since this is the committees' purpose. However, the Agency may wish on occasion to ask the independent scientific advisory committees whether a particular risk management option is consistent with their risk assessment.

Twenty seven principles of good practice have been developed. However, the different committees have different duties and discharge those duties in

¹⁴ FSA Secretariat

¹⁵ Joint FSA/HPA Secretariat, HPA lead ¹⁶ Joint FSA/HPA Secretariat, HPA lead

¹⁷ Joint FSA/HPA, FSA lead

¹⁸ Joint FSA/DH Secretariat

¹⁹ Joint Defra/FSA/DH Secretariat

different ways. Therefore, not all of the principles set out below will be applicable to all of the committees, all of the time.

This list of principles will be reconsidered by each committee annually as part of the preparation of its Annual report, and will be attached as an Annex to it.

Principles

Defining the issue

 The FSA will ensure that the issue to be addressed is clearly defined and takes account of stakeholder expectations. The committee Chair will refer back to the Agency if discussion suggests that a re-definition is necessary.

Seeking input

- The Secretariat will ensure that stakeholders are consulted at appropriate points in the committee's considerations and, wherever possible, SAC discussions should be held in public.
- 3. The scope of literature searches made on behalf of the committee will be clearly set out.
- 4. Steps will be taken to ensure that all available and relevant scientific evidence is rigorously considered by the committee, including consulting external/additional scientific experts who may know of relevant unpublished or pre-publication data.
- 5. Data from stakeholders will be considered and weighted according to quality by the committee.
- 6. Consideration by the secretariat and the Chair will be given to whether expertise in other disciplines will be needed.
- 7. Consideration will be given by the Secretariat or by the committee to whether other scientific advisory committees need to be consulted.

Validation

- 8. Study design, methods of measurement and the way that analysis of data has been carried out will be assessed by the committee.
- If qualitative data have been used, they will be assessed by the committee in accordance with the principles of good practice, e.g. set out in guidance from the Government's Chief Social Researcher²⁰.
- 10. Formal statistical analyses will be included wherever possible. To support this, each committee will have access to advice on quantitative analysis and modelling as needed.
- 11. When considering what evidence needs to be collected for assessment, the following points will be considered:
 - the potential for the need for different data for different parts of the UK or the relevance to the UK situation for any data originating outside the UK; and
 - whether stakeholders can provide unpublished data.
- 12. The list of references will make it clear which references have either not been subject to peer review or where evaluation by the committee itself has conducted the peer review.

Uncertainty

- 13. When reporting outcomes, committees will make explicit the level and type of uncertainty (both limitations on the quality of the available data and lack of knowledge) associated with their advice.
- 14. Any assumptions made by the committee will be clearly spelled out, and, in reviews, previous assumptions will be challenged.

²⁰ There is of guidance issued under the auspices of the Government's Social Research Unit and the Chief Social Researcher's Office (Quality in Qualitative Evaluation: A Framework for assessing research evidence. August 2003. www.strategy.gov.uk/downloads/su/qual/downloads/qqe-rep.pdf and The Magenta Book. www.gsr.gov.uk/professional guidance/magenta book/guidance.asp).

- 15. Data gaps will be identified and their impact on uncertainty assessed by the committee.
- 16. An indication will be given by the committee about whether the database is changing or static.

Drawing conclusions

- 17. The committee will be broad-minded, acknowledging where conflicting views exist and considering whether alternative hypotheses fit the same evidence.
- 18. Where both risks and benefits have been considered, the committee will address each with the same rigour.
- 19. Committee decisions will include an explanation of where differences of opinion have arisen during discussions, specifically where there are unresolved issues and why conclusions have been reached.
- 20. The committee's interpretation of results, recommended actions or advice will be consistent with the quantitative and/or qualitative evidence and the degree of uncertainty associated with it.
- 21. Committees will make recommendations about general issues that may have relevance for other committees.

Communicating committees' conclusions

- 22. Conclusions will be expressed by the committee in clear, simple terms and use the minimum caveats consistent with accuracy.
- 23. It will be made clear by the committee where assessments have been based on the work of other bodies and where the committee has started afresh, and there will be a clear statement of how the current conclusions compare with previous assessments.

- 24. The conclusions will be supported by a statement about their robustness and the extent to which judgement has had to be used.
- 25. As standard practice, the committee secretariat will publish a full set of references (including the data used as the basis for risk assessment and other committee opinions) at as early a stage as possible to support openness and transparency of decision-making. Where this is not possible, reasons will be clearly set out, explained and a commitment made to future publication wherever possible.
- 26. The amount of material withheld by the committee or FSA as being confidential will be kept to a minimum. Where it is not possible to release material, the reasons will be clearly set out, explained and a commitment made to future publication wherever possible.
- 27. Where proposals or papers being considered by the Board rest on scientific evidence, the Chair of the relevant scientific advisory committee (or a nominated expert member) will be invited to the table at Open Board meetings to provide this assurance and to answer Members' questions on the science. To maintain appropriate separation of risk assessment and risk management processes, the role of the Chairs will be limited to providing an independent view on how their committee's advice has been reflected in the relevant policy proposals. The Chairs may also, where appropriate, be invited to provide factual briefing to Board members about particular issues within their committees' remits, in advance of discussion at open Board meetings.

Glossary of Terms

Campylobacter: Commonest reported bacterial cause of infectious intestinal disease in England and Wales. Two species account for the majority of infections: *C. jejuni* and *C. coli*. Illness is characterized by severe diarrhoea and abdominal pain.

Clostridium botulinum: A Gram-positive, spore forming, neurotoxinproducing obligate anaerobic bacterium. Associated with infant, wound and foodborne botulism.

Hepatitis E: A viral hepatitis (inflammation of the liver) caused by the Hepatitis E virus. Hepatitis E is a waterborne disease, and contaminated water or food supplies have been implicated in major outbreaks.

Listeriosis: A rare but potentially life-threatening disease caused by *Listeria monocytogenes* infection. Healthy adults are likely to experience only mild infection, causing flu-like symptoms or gastroenteritis. However, *L. monocytogenes* infection can occasionally lead to severe blood poisoning (septicaemia) or meningitis.

Listeria monocytogenes: Gram-positive pathogenic bacteria that can cause listeriosis in humans.

Listeria spp: Ubiquitous bacteria widely distributed in the environment. Among the seven species of *Listeria*, only *Listeria monocytogenes* is commonly pathogenic for humans. It can cause serious infections such as meningitis or septicaemia in newborns, immunocompromised patients, and the elderly or lead to abortion.

Norovirus: A group of viruses that are the most common cause of infectious gastroenteritis (diarrhoea and vomiting) in England and Wales. The illness is generally mild and people usually recover fully within 2-3 days; there are no long term effects that result from being infected. Infections can occur at any age because immunity is not long lasting.

Pathogen: An infectious microorganism, bacteria, virus or other agent that can cause disease by infection.

Salmonella: A genus of Gram-negative bacteria which can cause salmonellosis in humans. Specific types of *Salmonella* are normally given a name, for example *Salmonella* Typhimurium has full name *Salmonella enterica* serovar Typhimurium.

Strain: Population within a species or sub-species distinguished by sub-typing.

Toxin: A poison, often a protein produced by some plants, certain animals fungi and pathogenic bacteria, which can be highly toxic for other living organisms.

Typing: Method used to distinguish between closely related microorganisms.

VTEC: Vero cytotoxin-producing *Escherichia coli* that characteristically produce powerful toxins that kill a variety of cell types, including Vero cells on which their effects were first demonstrated.

Glossary of Abbreviations

- ACMSF: Advisory Committee on the Microbiological Safety of Food
- APHA: Animal and Plant Health Agency
- AMR: Antimicrobial Resistance
- COC: Committee on Carcinogenicity
- COM: Committee on Mutagenicity
- DNA: Deoxyribonucleic acid
- Defra: Department for Environment Food and Rural Affairs
- ECDC: European Centre for Disease Prevention and Control
- EFIG: Epidemiology of Foodborne Infections Group
- EFSA: European Food Safety Authority
- EHT: Environmental Health Team
- EMA European Medicines Agency
- ESBL:Extended Spectrum Beta Lactamase
- FAO: Food and Agricultural Organisation
- FOI: Freedom of Information
- FSA: Food Standards Agency
- GACS: General Advisory Committee on Science
- HEV: Hepatitis E virus
- **IID:** Infectious Intestinal Disease
- LA-MRSA: Livestock-associated Meticillin Resistant Staphylococcus aureus
- OCPA: Office of the Commissioner for Public Appointments

Advisory Committee on the Microbiological Safety of Food: Annual Report 2015

PT: Phage type

RNA: Ribonucleic acid

SSRC: Social Science Research Committee

STEC: Shiga toxin-producing Escherichia coli

VTEC O157: Vero cytotoxin-producing Escherischia coli O157

WHO: World Health Organisation

References

- 1. Advisory Committee on the Microbiological Safety of Food (1993). Report of Progress 1990-92. HMSO, London. ISBN 0-11-321664-5.
- Advisory Committee on the Microbiological Safety of Food (1994). Annual Report 1993. HMSO, London. ISBN 0-11-321816-8.
- 3. Advisory Committee on the Microbiological Safety of Food (1995). Annual Report 1994. HMSO, London. ISBN 0-11-321921-0.
- 4. Advisory Committee on the Microbiological Safety of Food. Annual Report 1995. Department of Health, Wetherby. ISBN 1 85839 5763.
- 5. Advisory Committee on the Microbiological Safety of Food (1997). Annual Report 1996. Department of Health. ISBN 85839 7243.
- Advisory Committee on the Microbiological Safety of Food (1998). Annual Report 1997. Department of Health.
- 7. Advisory Committee on the Microbiological Safety of Food (1999). Annual Report 1998. Department of Health.
- 8. Advisory Committee on the Microbiological Safety of Food (2000). Annual Report 1999. Department of Health.
- 9. Advisory Committee on the Microbiological Safety of Food (2001). Annual Report 2000. Food Standards Agency. FSA/0012/0401.
- 10. Advisory Committee on the Microbiological Safety of Food (2002). Annual Report 2001. Food Standards Agency. FSA/0577/0502.
- 11. Advisory Committee on the Microbiological Safety of Food (2003). Annual Report 2002. Food Standards Agency. FSA/0817/0303.
- 12. Advisory Committee on the Microbiological Safety of Food (2004). Annual Report 2003. Food Standards Agency. FSA/0888/0204.
- 13. Advisory Committee on the Microbiological Safety of Food (2005). Annual Report 2004. Food Standards Agency. FSA/0990/0805.
- 14. Advisory Committee on the Microbiological Safety of Food (2006). Annual Report 2005. Food Standards Agency. FSA/1099/1006
- 15. Advisory Committee on the Microbiological Safety of Food (2007). Annual Report 2006. Food Standards Agency. FSA/11191/0807
- 16. Advisory Committee on the Microbiological Safety of Food (2008). Annual Report 2007. Food Standards Agency. FSA/1281/0908.
- 17. Advisory Committee on the Microbiological Safety of Food (2009). Annual Report 2008. Food Standards Agency. FSA/1409/0609.
- Advisory Committee on the Microbiological Safety of Food (2010). Annual Report 2009. Food Standards Agency.
- 19. Advisory Committee on the Microbiological Safety of Food (2011). Annual Report 2010. Food Standards Agency.

- 20. Advisory Committee on the Microbiological Safety of Food (2012). Annual Report 2011. Food Standards Agency
- 21. Advisory Committee on the Microbiology Safety of Food (2013). Annual Report 2012. Food Standards Agency
- 22. Advisory Committee on the Microbiology Safety of Food (2014). Annual Report 2013. Food Standards Agency
- 23. Advisory Committee on the Microbiology Safety of Food (2014). Annual Report 2014. Food Standards Agency
- 24. Advisory Committee on the Microbiological Safety of Food (1992). Report on Vacuum Packaging and Associated Processes. HMSO, London. ISBN 0-11-321558-4.
- 25. Advisory Committee on the Microbiological Safety of Food (1993). Report on *Salmonella* in Eggs. HMSO, London. ISBN 0-11-321568-1.
- 26. Advisory Committee on the Microbiological Safety of Food (1993). Interim Report on *Campylobacter*. HMSO, London. ISBN 0-11-321662-9.
- 27. Advisory Committee on the Microbiological Safety of Food (1995). Report on Verocytotoxin-Producing *Escherichia coli*. HMSO, London. ISBN 0-11-321909-1.
- 28. Advisory Committee on the Microbiological Safety of Food (1996). Report on Poultry Meat. HMSO, London. ISBN 0-11-321969-5.
- 29. Advisory Committee on the Microbiological Safety of Food (1998). Report on Foodborne Viral Infections. The Stationery Office, London. ISBN 0-11-322254-8.
- Advisory Committee on the Microbiological Safety of Food (1999). Report on Microbial Antibiotic Resistance in Relation to Food Safety. The Stationery Office, London. ISBN 0-11-322283-1.
- Advisory Committee on the Microbiological Safety of Food (1999). Report on Microbial Antibiotic Resistance in Relation to Food Safety. Synopsis. The Stationery Office, London. ISBN 0-11-322295-5.
- 32. Advisory Committee on the Microbiological Safety of Food (2001). Second Report on *Salmonella* in Eggs. The Stationery Office, London. ISBN 0-11-322466-4.
- 33. Advisory Committee on the Microbiological Safety of Food. Report on *Mycobacterium bovis*. A review of the possible health risks to consumers of meat from cattle with evidence of *Mycobacterium bovis* infection. Food Standards Agency. January 2002. FSA/0400/2002.
- 34. Advisory Committee on the Microbiological Safety of Food. Second Report on *Campylobacter*. June 2005. Food Standards Agency. FSA/0964/0605.
- Advisory Committee on the Microbiological Safety of Food. Ad Hoc Group on Infant Botulism. Report on Minimally Processed Infant Weaning Foods and the Risk of Infant Botulism. July 2006. Food Standards Agency. FSA/1092/0706
- Advisory Committee on the Microbiological Safety of Food. Ad Hoc Group on Botulism in Cattle. Report on Botulism in Cattle. December 2006. Food Standards Agency. FSA/1112/1206.
- 37. Advisory Committee on the Microbiological Safety of Food. *Ad Hoc* Group on Safe Cooking of Burgers. June 2007. Food Standards Agency. FSA/1183/0607.

- 38. Advisory Committee on the Microbiological Safety of Food. *Ad Hoc* Group on Botulism in Cattle, Sheep and Goats. February 2009. Food Standards Agency. FSA/1312/0209.
- Advisory Committee on the Microbiological Safety of Food. Ad Hoc Group on Vulnerable Groups Report on the Increased Incidence of Listeriosis in the UK. July 2009. Food Standards Agency. FSA/1439/0709.
- 40. Advisory Committee on the Microbiological Safety of Food. *Ad Hoc* Group on Vulnerable Groups. Risk profile in relation to toxoplasma in the food chain. September 2012. Food Standards Agency.
- 41. Advisory Committee on the Microbiological Safety of Food. *Ad Hoc* Group on Raw, Rare and Low Temperature Cooked Foods. April 2014. Food Standards Agency.
- 42. Advisory Committee on the Microbiological Safety of Food. *Ad Hoc* Group on Foodborne Viral Infections. An update on viruses in the food chain. March 2015. Food Standards Agency.
- 43. Committee on Standards in Public Life (Nolan: First Report). May 1995.
- 44. The Commissioner for Public Appointments. Office of the Commissioner for Public Appointments. Code of Practice for Ministerial Appointments to Public Bodies August 2009.
- 45. Government Office for Science Code of Practice for Scientific Advisory Committees. December 2007.
- 46. <u>https://www.food.gov.uk/news-updates/news/2015/14091/appointments-to-the-advisory-committee-on-the-microbiological-safety-of-food</u>
- 47. Food Standards Agency. Report on the Review of Scientific Committees. 2002. FSA/0567/0402.
- 48. Advisory Committee on the Microbiological Safety of Food. ACM/1164. Update on viruses in the food chain.
- 49. Advisory Committee on the Microbiological Safety of Food. ACM/1179. Initial response to the ACMSF virus report.
- 50. Advisory Committee on the Microbiological Safety of Food. ACM/1166. Risk assessment of salmonella from shell eggs.
- 51. Advisory Committee on the Microbiological Safety of Food. ACM/1192. Assessment of the risk of avian influenza viruses via the food chain.
- 52. Advisory Committee on the Microbiological Safety of Food. ACM/1191. Shiga toxin producing *E.coli* (STEC) in food.
- 53. Advisory Committee on the Microbiological Safety of Food. ACM/1181. Risk assessment for the use of *Mycobacterium* bovis BCG Danish Strain 1331 in Cattle: Risks to public health.
- 54. Advisory Committee on the Microbiological Safety of Food. ACM/1165. Food safety risk of recycled manure solids used as bedding for dairy cattle.
- 55. Advisory Committee on the Microbiological Safety of Food. ACM/1193. Histamine in cheese.

- 56. Advisory Committee on the Microbiological Safety of Food. ACM/1178. Output from horizon scanning workshop.
- 57. Advisory Committee on the Microbiological Safety of Food. ACM/1196. FSA Board paper: Framework for risky foods and its application to burgers.
- 58. Advisory Committee on the Microbiological Safety of Food. ACM/1180. Campylobacter Retail Survey.
- 59. Advisory Committee on the Microbiological Safety of Food. ACM/1167. Food and You Survey from Wave 3.
- 60. Advisory Committee on the Microbiological Safety of Food. ACM/1168. A microbiological survey of pre-packed ready-to-eat sliced meats at retail in UK small to medium sized enterprises.
- 61. Advisory Committee on the Microbiological Safety of Food. ACM/1169. Epidemiology of Foodborne Infections Group.
- 62. Advisory Committee on the Microbiological Safety of Food. ACM/1182. Epidemiology of Foodborne Infections Group.