Advisory Committee on the Microbiological Safety of Food

Annual Report 2012

Advises the Food Standards Agency on the
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Contents

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[1-20] and in a series of subject-specific reports.[21-36]

Foreword

1. I am pleased to present the twenty-first Annual Report of the ACMSF covering 1 January 2012 to 31 December 2012. Over the past year, the Committee has provided advice to the FSA on a raft of issues relating to the microbiological safety of food.

2. In January the FSA sought our views on the actions they had taken in relation to sprouted seeds and the Shiga-toxin producing *Escherichia coli* (STEC) outbreaks in France and Germany in 2011 and an outbreak caused by *Salmonella* Bareilly in the UK in 2010. Following consideration the Committee had no objection to the proposed controls for sprouted seeds. A Committee subgroup also provided additional comments on the FSA's proposals.

3. In May we considered the FSA's request for advice on whether to undertake research to examine uptake and persistence of pathogens within plants in commercially relevant growth cycles in the UK. We also considered the viability and pathogenicity of the bacteria which have been internalised. Members responded by identifying research needs.

4. The Committee concluded its work concerning the issue of *Toxoplasma* in the food chain. We approved the *Ad Hoc* Group on Vulnerable groups' report: Risk profile in relation to *Toxoplasma* in the food chain and the summary of responses to the public consultation. The group reviewed the current evidence on toxoplasmosis in humans and animals in the UK, considered the risks from acquiring infection from food and identified what work may be needed to obtain robust data on foodborne sources of toxoplasmosis. The group also looked at the toxoplasmosis advice given to vulnerable groups in the UK and other countries. The report was formally submitted to the FSA and published in September 2012.

5. Following our endorsement of the risk assessment framework used in the *M. bovis* in unpasteurised milk and milk products (paper ACM/1047) and the ACMSF quinquennial review (carried out in 2011) that recommended that the Committee should be more objective in presenting uncertainties in its risk assessments, we considered a paper on approaches to risk assessment. We welcomed the proposed approach and framework and subsequently considered the issue of risk assessment output terminology.

6. Following a horizon scanning exercise, the Committee deliberated on the changing food production techniques in the hospitality sector that may impact on microbiological food safety. We agreed to take this forward by establishing a subgroup to assess the microbiological risks to consumers

associated with use of low temperature cooking/slow cooking, foods of animal origin served raw and foods of animal origin served rare.

7. The Social Science Research Committee provided the Committee with an update on Social Science Research of relevance to ACMSF. We were provided with an overview of the evidence review of food safety behaviours in the home which had originated from ACMSF's request for work to help identify behaviours that might be putting the over 60s at risk of listeriosis. We also received an update on wave two of the "Food and You" Survey which measures public attitudes, knowledge and behaviours towards food over time. In addition we received a snapshot of the in-home kitchen practices study.

8. The Committee, through a small group of members, reviewed the microbiological food safety aspects of the Waste and Resources Action Programme's (WRAP) draft report on the 'Quality, safety and use of digestate in UK agriculture'. The Committee approved the response to the report.

9. The Committee was updated on the publication of the revised Code of Practice for Scientific Advisory Committees. The revised CoPSAC (published in November 2011) provides a guidance framework for scientific advisory committees.

10. We improved the process for agreeing our work programme following a recommendation made in the 2011 quinquennial review of the ACMSF. In 2013 we will report on the outcome of the *Ad Hoc* Group on Foodborne Viral Infections work. The group is looking at the risk to human health associated with foodborne viral infections especially norovirus. We will also report on the outcome of work of the *Ad Hoc* Group on Raw, Rare and Low Temperature Cooked Foods who are assessing the microbiological risks to consumers associated with use of low temperature cooking/slow cooking, foods of animal origin served raw and foods of animal origin served rare. We will also continue to consider the risks posed by *Campylobacter, Escherichia coli, Listeria* and *Salmonella*.

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.

Professor Sarah O'Brien
Chair

Introduction

1. This is the twenty first Annual Report of the Advisory Committee on the Microbiological Safety of Food and covers the calendar year 2012.

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 Principles[37], the guidance issued by the Office of the Commissioner for Public Appointments (OCPA)[38] and the Government Office for Science Code of Practice for Scientific Advisory Committees[39]. 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.

Re-appointments in 2012

6. The periods of appointments for Mr John Bassett, Mr David Nuttall, Dr Sally Millership and Mrs Jenny Morris expired on 31 March 2012. Messrs Bassett and Nuttall were re-appointed for a further 2 years from 1 April 2012 until 31 March 2014. Dr Millership and Mrs Morris were reappointed for a further 4 years from 1 April 2012 until 31 March 2016.[40]

Committee and Sub-Group meetings

7. The full Committee met twice in 2012 - on 19 January and 29 May. The two meetings were chaired by Professor Sarah O'Brien and were open to members of the public.

8. The *Ad Hoc* Group on Vulnerable Groups (Chair: Dr Rick Holliman) met once 2012. In April the group considered comments received in response to the public consultation on its report: Risk profile in relation to toxoplasma in the food chain. The full Committee approved the publication of the report together with the response to the consultation comments. The report was published in September 2012.

10. The *Ad Hoc* Group on Foodborne Viral Infections (Chair: Professor Sarah O'Brien) met four times in 2012. The meetings were used for gathering evidence and for addressing areas highlighted in the group's workplan. The group expect to publish their draft report by summer 2013.

11. The Newly Emerging Pathogens Working Group (Chair: Professor Peter Williams) met once in 2012. They reported on their consideration of foodborne health risks associated with bleeding calf syndrome also known as Bovine Neonatal Pancytopaenia (BNP). BNP is a haemorrhagic disease, first reported in May 2009 which primarily affects very young calves resulting in substantial internal and mucous membrane bleeding and associated with a very high mortality rate.

12. The *Ad Hoc* Group on Raw, Rare and Low Temperature Cooked Foods (Chair: Dr Roy Betts) met four times in 2012. The full Committee agreed to establish this group following a horizon scanning exercise. ACMSF considered a presentation on emerging issues in the catering sector.

13. The Surveillance Working Group (Chair: Professor John Coia) provided comments via correspondence on the FSA's draft protocols for surveys on *Campylobacter* in chicken and *Listeria* in cooked meats.

Current membership and Declarations of Interests

14. 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[41]. Declarations made are recorded in the minutes of each meeting.

Personal liability

15. 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 1999[8] 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 Report[14]).

Openness

Improving public access

16. 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/

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

acmsf@foodstandards.gsi.gov.uk

18. 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

19. Following the recommendations flowing from the FSA's Review of Scientific Committees[42], the ACMSF decided that from 2003 onwards all of its full Committee meetings should be held in public.

20. All of the 2012 Committee meetings were held in Aviation House, the FSA's London Headquarters.

21. 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 cross-membership

22. The Secretariat provided Members with regular reports of the work of other Scientific Advisory Committees advising the FSA in 2012. 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 2012

Internalisation of pathogens by fresh produce

23. At its May 2012 meeting the FSA sought the Committee's views on whether to undertake research to examine uptake and persistence of pathogens within plants in commercially relevant growth cycles in the UK. Members were also asked to comment on the viability and pathogenicity of the bacteria which have been internalised.[43] The specific questions put to the Committee were:

    - Based on the current evidence, does the Committee consider there to be a need for further research to establish the implications for consumer health of the internalisation of pathogens in fresh produce?

    - If so, what does the Committee consider to be the key evidence gaps that need to be addressed?

24. The paper presented to the Committee reported that ready-to-eat salad vegetables and fruit have been implicated in 8 outbreaks of foodborne disease in England and Wales between 2007 and 2010. The most commonly identified aetiological agent was *Salmonella* (6 outbreaks). The other identified agents were *E. coli* O157 and Norovirus. One issue periodically questioned is the possibility and extent to which pathogens can become internalised into plant tissue and thereby become protected from the action of any washing or sanitising process.

25. A 2008 FAO/WHO report on 'Microbiological hazards in fresh leafy vegetables and salads examined the available research and concluded that internalisation is possible during pre-harvest but only after exposure of young plants to high pathogen loads. Similarly, during post-harvest, internalisation into damaged or cut surfaces of leafy vegetables has been demonstrated under experimental conditions using high inocula. Their view was that there was no evidence to indicate that internalization is significant in practice, particularly when Good Agricultural Practice (GAP) is implemented. However, the available information on non-experimentally induced internalisation under actual GAP, Good Manufacturing Practice and Good Hygiene Practice is limited.

26. A review on internalisation of *E. coli* O157:H7 and *Salmonella* spp. in plants concluded that many studies have shown that both these

pathogens can internalise within a variety of tissue types during many different points in the growing and distribution process. There are also a number of factors, such as type of plant, strain and/or serovar of bacteria, route of contamination and age of plant that can influence the extent of internalisation. Two major routes of entry are suggested:

- Bacteria enter through natural openings in the plant surface (e.g., stomata, lenticels) or through sites of biological or physical damage.
- Bacteria are pulled into the internal tissues along with water.

In a further review Hirneisen *et al* examined root uptake into food crops and concluded (Kirsten A. Hirneisen, Manan Sharma and Kalmia E. Kniel. Foodborne Pathogens and Disease. May 2012, 9(5): 396 – 405):

- Uptake through internalisation is a plant-pathogen specific interaction.
- The plant growth substrate used plays a large role in the uptake of both bacterial and viral pathogens in plants.
- Intact, healthy, non-injured roots seem to discourage the uptake of bacteria and viruses into plants.
- Generally, the presence of internalised pathogens in roots of plants does not directly correlate with internalised pathogens in the edible or foliar tissues of crops.

27. Dr Nicola Holden from the James Hutton Institute was invited to give a presentation on pathogen internalisation by fresh produce and recent research on this topic. Dr Holden summarised current evidence for internal colonisation of produce by pathogens and highlighted some international outbreaks of illness associated with sprouts, noting the pathogens most commonly involved. The mechanisms of internalisation, colony formation and localisation of internalised bacteria were also presented. Dr Holden summarised her recent research on internalisation of Enterohaemorrhagic *E. coli* (EHEC) in lettuce and spinach roots and leaves and gave details of other research groups working in this area. The strengths and weaknesses of the existing body of research on pathogen internalisation were highlighted, including the major knowledge gaps. Potential factors that may increase the risk of internalisation were also suggested. Dr Holden concluded that internalisation can occur but is rare and varies depending on factors such as plant species, bacterial species, how plants are grown and plant health. The risks from internalisation via roots appear to be low and there is no apparent correlation between

internalisation in roots and presence in edible foliage, although further work is needed to confirm this.

28. The following comments and questions were raised by Members in the ensuing discussions:

- The reason for the difference in bacterial uptake with high and low inoculum levels was queried. Dr Holden responded that studies had shown bacteria on compost could die quite easily, particularly with high inoculums, reaching a threshold level where they may eventually become viable but non-culturable. One study had shown colonisation with viable, non-culturable bacteria was possible where viability was recovered. It was not clear if this was happening with the low inoculum levels.

- It was asked whether the internal colonies are due to bacterial growth or whether bacteria accumulate. Dr Holden explained that growth was definitely seen with an increase and then a plateau in bacterial numbers although the growth rate was not known.

- In response to a query on what work had been done to look at virus internalisation and viability Dr Holden responded that some studies had looked at internalisation and presence of surrogate viruses but virus presence was only detected using PCR and therefore viability was not determined.

- Clarification was sought whether the fate of internalised bacteria after harvesting and storage of produce had been investigated as it was important to know whether the bacteria continue to grow. Dr Holden responded that this would probably depend on various factors but if produce was stored below the minimum growth temperature, bacterial growth was not seen. However studies had shown reactivation of bacterial growth after cold shock was possible. Bangor University are currently looking at this but there are not sufficient studies to give a definitive answer at present. Dr Holden also added that a study had shown that pathogens passaged through plants maintained their infectivity.

- It was suggested that investigation of fresh produce linked to outbreaks to try and determine whether the bacteria were internalised, may provide useful information as this was not known at present. It was also suggested that further sampling of fresh produce would be useful to determine the true prevalence and concentration of internalised pathogens.

- In response to a question on experimental practice Dr Holden confirmed she was confident that Gentamicin was sterilising the surface of experimental produce.

- It was queried whether bacteria associated with hydroponics systems are generally planktonic whilst those associated with soil are in a biofilm. Dr Holden responded that some variation was seen in hydroponic populations but biofilms were predominant in soil. A correlation between motility and colonisation of plants had been noted but no correlation between biofilm formation and colonisation had been seen.

- The relevance of experimental research to real life conditions and field studies was questioned, particularly in light of variation between plant types and effects of external conditions on plants. Dr Holden responded that fresh produce was often grown under hydroponic systems or protected conditions and so there was some relevance to experimental conditions.

- The existence of pathogen risks to which consumers have not been previously exposed, from imported produce from non-temperate climates was raised. In was noted that outbreaks associated with food from other countries often involved multiple pathogens as the population had no existing immunity. It was also noted that the systems in countries where crops were grown for import to the UK were often very well defined. The mechanism by which seeds may become contaminated was highlighted as relevant and therefore traceability was considered an important consideration.

- It was suggested that work to look at the effectiveness of current risk management strategies and their effectiveness at removing internal bacteria would be valuable.

- The potential for synergies with the Advisory Committee on Animal Feedingstuffs (ACAF) was also highlighted in terms of seeds that may be used for animal feed.

29. The ACMSF Chair summarised the research needs identified by the Committee. These included further work to determine the prevalence, concentration and viability of pathogens (including viruses) in fresh produce in both field and experimental conditions and research to look at the fate of these organisms after harvesting. The Committee also recommended that where fresh produce is implicated in outbreaks of disease it may be possible to investigate if pathogens had been internalised in the produce. Further investigations to look at variations with

different species types, growth conditions and phenotypic response were also recommended.

The microbiological safety of sprouted seeds

30. In January the FSA briefed the Committee on activities in relation to the microbiological safety of sprouted seeds[44]. The paper presented to members provided an update on activities following the Shiga-toxin producing *Escherichia coli* (STEC) outbreaks in France and Germany in 2011 and an outbreak caused by *Salmonella* Bareilly in the UK in 2010. The current FSA advice in relation to sprouted seed preparation for producers, caterers and the public was outlined, and it was highlighted that in Germany the advice goes further in recommending that vulnerable groups should only eat sprouted seeds that have been cooked. FSA enforcement advice for local authorities and the European Food Safety Authority's (EFSA) scientific opinion on the public health risks from contaminated seeds and sprouted seeds were outlined. The Commission have proposed a number of potential control options for sprouted seeds which are currently under discussion. UK industry guidance on sprouted seed production is also under development. The Committee was asked to consider whether, in light of the actions taken, there is a residual risk of outbreaks associated with sprouted seeds and to comment on the relative risk compared to other fresh produce. ACMSF was also asked to advise whether some groups of consumers are particularly vulnerable to the risk of illness from sprouted seeds.

31. The Committee made the following comments in discussion:

- A risk to human health does remain in sprouted seed production and outbreaks will continue to occur but the level of risk and likely frequency of outbreaks is difficult to quantify.

- The outbreak due to *S.* Bareilly appeared to have been associated with very low contamination levels that may not have been picked up by many laboratories and this issue also needed consideration.

- It was suggested that the distinction between 'ready to wash' and 'ready to eat' sprouted seeds may not be recognised by consumers and the different advice in relation to these products and the variety of guidance on sprouted seed packaging could be confusing. It was clarified that 'ready to eat' meant the product has been washed commercially.

- It was highlighted that it is difficult for consumers to take protective food safety steps in relation to sprouted seed consumption especially when eating out. It was also noted that if advice to vulnerable groups was issued this would not be inconsistent with existing food safety advice for immunocompromised individuals and fresh produce. It was considered that advice to cook sprouted seed until piping hot may have limited practicality as the product loses its crunchy texture.

- Adult women are the highest risk group for outbreaks linked to sprouted seeds probably because they have the highest exposure.

- The application of seed irradiation as a control step was briefly discussed.

- It was suggested the issue may need broadening to include consideration of sprouting seeds for animal feed and ACAF may have an interest in this.

- Dr Wadge (FSA Chief Scientist) clarified that the Agency needs a qualitative sense of how important the risk from sprouted seeds is compared to other food related risks to help inform negotiations on control options and consumer advice.

- The FSA's Departmental representative (Ms Redmond) provided a summary of the proposed Commission controls for sprouted seeds. These included requirements for irrigation and washing water, approval of establishments, traceability, microbiological food safety criteria and import controls/certification.

- Concerns were raised over the use of microbiological criteria as a control measure as these cannot guarantee the safety of a product. It was noted the suggestion is for these to be applied as part of a food safety management system.

- It was highlighted that the Committee had not seen the evidence that underpinned the proposed control options and would need to look at this data in more detail in order to be able to comment on and rank the most effective control options.

32. The Committee indicated that there was no disagreement in principle with any of the proposed controls for sprouted seeds. However, it was noted that as they had not been able to review all the relevant data, they were not in a position to rank the risks from sprouted seeds relative to other food safety risks. A teleconference was proposed to discuss the issue further and provide advice to the FSA by the short deadline required.

Ms Hopwood, Prof McDowell, Mr Basset, Dr Betts and Prof Coia were nominated to participate in the teleconference.

33. The above mentioned teleconference was held as suggested by the Committee. The subgroup's mandate was to discuss the FSA's questions in more detail.

34. The subgroup was asked to:

    a) comment on the microbiological risks associated with the production of sprouted seeds,

    b) indicate the risk of illness from consumption of sprouted seeds relative to the risk from consuming other types of fresh produce and;

    c) advise which groups of consumers may be at particular risk of illness from the consumption of sprouted seeds

35. The subgroup concluded that *Salmonella* and STEC are the major pathogenic bacteria associated with sprouted seeds but other pathogens, such as *Listeria monocytogenes* or *Bacillus cereus*, may also be a risk.

36. The supply route of the seed from farm to sprout producer can be extended and convoluted. Contamination of the seed can occur in the field, during harvest, storage or transportation. Since no decontamination process can currently be guaranteed to eliminate bacterial contamination prior to sprouting, any pathogenic bacteria which may be present on the seeds can multiply during the sprouting process due to the warm, humid conditions. The sprouted seeds are then often eaten raw or lightly cooked by the consumer.

37. The potential for the sprouting process to result in significant numbers of pathogens being present on a product which is likely to be eaten raw, leads to the conclusion that there is a higher risk of illness from their consumption compared to other types of fresh produce although this would be difficult to quantify.

38. Current FSA advice to consumers on the consumption of sprouted seeds does not include advice aimed at any specific group. However in Germany the German Federal Institute for Risk Assessment (BfR) advises that those with a weak immune system should only eat sprouted seeds which have been cooked.

39. There is no information on the levels of pathogenic bacteria present in the sprouted seeds which caused the recent outbreaks and the profile of those who became ill in Germany does not match the normal profile seen in STEC outbreaks - healthy adult females as opposed to the very young

and the elderly. If, when present, pathogen numbers in sprouted seeds are low then those normally assumed to be particularly vulnerable to illness (i.e. the immunocompromised) would be at particular risk of infection. However, if pathogen numbers are high, then it could be assumed that all groups, whether healthy or vulnerable, would be at risk of infection. The group concluded that based on the current evidence it is difficult to target specific groups of people who may be particularly vulnerable to infection.

ACMSF risk assessment

40. In January the FSA reminded members that the Committee welcomed the risk assessment framework used in the *M. bovis* in unpasteurised milk and milk products paper. It was also drawn to the Committee's attention that the ACMSF quinquennial review had recommended that the Committee should be more objective in presenting uncertainties in its risk assessments. The FSA then presented a paper on ACMSF approaches to risk assessment which would assist in addressing these two issues.[45] It was explained that the paper was in two parts. The first part proposed a way forward and a framework for future ACMSF risk assessments. The second part provided some context to ACMSF risk assessments, explaining the different situations in which risk assessment was requested and how assessments were currently handled, including rapid *ad hoc* assessments. The FSA highlighted three areas that required consideration; the clarity of the risk assessment question, using the correct framework for assessment and reaching a common understanding in the way outputs were presented.

41. Members agreed with the proposed approach and framework. It was noted that adopting a formalised approach does not have to increase the resources required as using a risk assessment framework can assist in clarifying the key issues. Some Committee members preferred to review external risk assessments rather than producing ACMSF risk assessments and suggested having the flexibility to put forward risk management options was useful, recognising that it is not in the Committees' remit to make risk management decisions. It was cautioned that involvement of the committee in *ad hoc* incident risk assessments would need careful management to ensure this did not slow down the incident management process and to ensure as full a picture as possible is provided on incidents in order to assist with the Committees' assessments. It was suggested that a formal risk assessment approach and a robust framework were particularly beneficial when uncertainty is greatest and data are lacking as this drives rigour in looking at the

evidence and allows transparency in how any judgement on the level of risk is made.

42. It was noted that the European Centre for Disease Prevention and Control (ECDC) has published recent guidelines on rapid approaches to risk assessment methodology.

43. The Committee endorsed the proposed approach and framework, recognising that different approaches were appropriate for different situations. The ACMSF, at present, were still in a situation where they produced their own risk assessments as well as reviewing external assessments. The Committees' terms of reference, with respect to risk assessments, remained appropriate and did not need amending as long as the boundaries between risk assessment and risk management were clearly recognised. The ACMSF Chair requested the ECDC guidelines be circulated to Members and asked the Secretariat to bring a paper on risk assessment output terminology to the next meeting for discussion.

44. Following the endorsement of the risk assessment framework presented to the Committee by the FSA in January 2012, in May a paper was presented to the Committee on risk assessment output terminology.[46] A wide range of terms and descriptors are currently used to characterise the level of risk and the uncertainty associated with a risk assessment and clear articulation of these is needed to avoid ambiguity. Adoption of a standardised approach by the Committee would improve the transparency and consistency of its assessments. A number of possible approaches for qualitative risk assessment outputs were outlined in a paper presented to the Committee. The Committee was asked if it wished to standardise descriptors used to convey risk estimates and uncertainty and, if so, which descriptors it would wish to use.

45. Members agreed that a consistent approach for outputs in terms of risk estimate and uncertainty was desirable and a simple, understandable system would be most appropriate. The importance of defining the model adopted by ACMSF was agreed but development of ACMSF's own risk assessment terminology was not considered necessary. It was agreed that for clarity the full terminology selected for risk estimates and uncertainty should be published with each risk assessment produced.

46. It was suggested that in some cases estimates of uncertainty based on published scales appeared to be too precise. There was a danger of implying an excessive level of accuracy which could be misleading given the high levels of uncertainty associated with most risk assessments. It

was agreed in most cases a subjective description of uncertainty would suffice.

47. Some members felt that use of numerical outputs for risk classification was more appropriate as these were more easily understood by consumers than terms such as low, medium and high. It was suggested that the tools used in clinical trials could provide some guidance. It was also suggested that the Committee should be guided by the approaches most likely to convey a clear idea of what the Committee means when developing outputs for risk managers.

48. Table 3 in paper ACM/1065 was unanimously selected by the Committee as most appropriate for the presentation of risk level classification. There was discussion over the most suitable approach for describing uncertainty. Some members felt table 4 (GRADE scale for quality of evidence) was more suitable as this described the quality of the evidence and was representative of the situation at the time of the risk assessment. It was suggested the text in the low quality descriptor should be altered from “further research is very likely to have an important impact on our confidence in the assessed risk and is likely to change the estimate” to “further research is very likely to have an important impact on our confidence in the assessed risk and may change the estimate”. Other members felt table 4 was a description of future research needs and table 2 was more appropriate as it described the uncertainty at the time the risk assessment was carried out and it was more compatible with the risk level classification system agreed. However it was also suggested table 2 was overly complex involving use of several parameters that may not always be available and was more suited for quantitative risk assessments.

49. The discussion concluded with the Committee noting that table 3 had been chosen as the most appropriate for ACMSF risk level classification and tables 2 and 4 were most appropriate for describing uncertainty. However, it was recognised that applying different combinations of these approaches may be required in different circumstances and they should be applied in practice to see what works.

Risk profile in relation to Toxoplasma in the food chain

50. Dr Rick Holliman presented a paper which summarised responses to the public consultation on ACMSF’s toxoplasmosis report.[47] It was reported that responses received had been generally supportive and a number of revisions were made to the report to address suggested additions. These included additional text on neurological associations with toxoplasmosis,

reference to a newly developed test to aid in distinguishing the route of infection and further emphasis on the need to consider immunocompetent individuals who may go on to become immunocompromised in later life. Dr Holliman noted that a number of consultation responses related to risk management issues. He indicated that these would be forwarded to FSA. The Committee were asked to approve the consultation response and final report.

51. The Committee endorsed the report and agreed to formally hand it over to the FSA.

Horizon scanning

52. ACMSF discussed horizon scanning at their January 2011 meeting and identified four broad cross-cutting themes. It was agreed that changing food production techniques in the hospitality sector that may impact on microbiological food safety was a priority for consideration by the Committee. Mrs Buller and Mr Nuttall were invited to present the findings of an information gathering exercise they had undertaken on emerging issues in the catering sector to inform discussion on this topic.[48]

53. Mrs Buller outlined the purpose of the exercise and explained how views were gathered from the catering sector by approaching a range of leading organisations with a number of questions on emerging issues. It was noted that the exercise provided a snapshot of catering industry views rather than a fully representative survey.

54. Mr Nuttall highlighted some emerging themes from the consultation exercise, these included; concerns over the lack of guidance on sous-vide/water bath cooking, the use of vacuum packaging/gas flushing to extend shelf life, the effect of salt reduction on microbiological safety/shelf life, a trend to serve rare pork, the use of raw eggs in mousses and mayonnaise, norovirus contamination of shellfish, cross-contamination in catering businesses linked to *Escherichia coli* and undercooking of chicken livers for pâté. It was noted that many of the issues raised related to risk management and communication of existing food safety messages which were outside the remit of the Committee.

55. Mr Nuttall concluded that the exercise had shown that reinforcing food safety messages and educating the public on risks from eating rare/undercooked foods may be required and that there was also a need for food safety guidance on sous-vide/water bath/slow cooking following introduction of these methods into the domestic market. It was also

highlighted that these cooking techniques raise conflicting opinions amongst caterers and the food safety messages around these practices need clarifying.

56. In response to questions from the Committee Mrs Buller explained that it was difficult to calculate the response rate as the questionnaire was passed to key contacts who were asked to forward it on to colleagues. Mrs Buller also clarified that, in terms of gaps in responses, they would have liked more feedback from the high end restaurant sector.

57. The Committee made the following observations on the presentation:

    - Many of the issues identified related to risk management rather than risk assessment and were for the FSA to take forward.
    - Data on the effects of lower temperature cooking on pathogens had not been looked at since the report on the safe cooking of burgers and could be revisited. There is also a potential resurgence in the popularity of beef carpaccio which may not have been previously considered by the Committee.
    - The issue of salt reduction and its effects on microbiological food safety was considered previously by ACMSF but a refresh on the discussions may be useful.
    - The current *Ad hoc* Group on Foodborne Viral Infections has considered information on norovirus in oysters which will be covered in their report.
    - There is a need for more information on water bath cooking to establish whether there are real concerns about their use and the evidence base for current advice on cooking practices should be reviewed.
    - There may be a need to look at consumer perceptions when eating in catering establishments, where customers may assume there are no risks for them.

58. The Committee concluded the discussion by identifying three main issues that had emerged from discussions; extrapolation of data on pathogen survival at low temperature/time combinations (such as those used in water bath cooking), evidence on the microbiological safety of raw/rare foods and consumer perceptions of food safety when eating in catering establishments. It was suggested that a subgroup be formed to consider these issues in more detail and report back to the Committee. Mrs Morris, Ms Hopwood, Prof McDowell, Mrs Buller, Dr Betts and Mr Nuttall were

nominated to participate in the subgroup. It was suggested that the first two topics could be combined and the third may require input from the Social Sciences Research Committee to review existing evidence.

59. In May the Committee was reminded that they received a presentation (in January 2012) on a snapshot survey of changing techniques in the hospitality sector that might impact on microbiological safety. A subgroup was given the task to look at the areas identified for attention: extrapolation of data on pathogen survival at low cooking temperatures and the microbiological safety of raw and rare foods. Dr Roy Betts, Chair of the group was invited to provide an update.

60. Dr Betts reported that the group held a teleconference to discuss the approach, scope, timings, terms of reference and potential outputs for the work. The group agreed that the issues under consideration were not restricted to the catering sector and widened the scope to include the domestic and hospitality sectors. The Group also agreed to focus on products of animal origin as they posed the main risk. The output would be a paper with recommendations and a presentation to the Committee. It was hoped the work would take 12 months. The Terms of Reference agreed by the Group were to assess the microbiological risks to consumers associated with use of low temperature cooking/slow cooking, foods of animal origin served raw, foods of animal origin served rare and to identify any gaps in the data that would assist in a risk assessment.

ACMSF response to the Waste and Resources Action Programme (WRAP) risk assessment on quality, safety and use of digestate in UK agriculture

61. The WRAP report on anaerobic digestate (AD) was discussed at the Committee's September 2011 meeting. At that meeting it was agreed that a subgroup of Members would consider the report in detail and prepare a draft response on behalf of the Committee. In May, Mr McMullin presented the draft response to the full Committee for comment.[49]

62. Mr McMullin noted that, in general terms, there was nothing in the report the subgroup had disagreed with. It was felt the report dealt with most of the relevant food safety risks, focussing on those of greatest importance. The approach used was considered generally robust and where there was a lack of data a qualitative risk assessment approach was applied. However, the risk assessment outcome figures given in the report might imply a greater level of accuracy than was reasonable based on the data. The report concluded that, where products were produced in accordance

with PAS100 standards, the risk was expected to be low, equivalent to less than 1 extra case of illness per year of the diseases considered. It was noted that pasteurisation is a useful control step but it was not clear from the report where the pasteurisation step should be applied and there was concern that some material could pass through the system without treatment, clarification of this issue was needed in the final report. Conflicting information was presented in some parts of the *Clostridium botulinum* section but the conclusion, that the overall risk was low, was considered reasonable. It was highlighted that *C. botulinum* is naturally present in the environment and goes untreated onto land. It is therefore unreasonable to expect a zero risk, and the issue is whether the potential risk through AD is any greater.

63. The subgroup felt the risk management matrix worked well but had some particular concerns over untreated materials that may go onto crops which are not subject to further heat treatment, particularly in relation to Vero cytotoxin-producing *E. coli*. They also felt that those dealing with TSE issues should be made aware of the WRAP report, acknowledging that high risk material should not be present in digestates anyway.

64. Members made a number of comments on the proposed ACMSF response. It was noted that the presence of and difficulties in detecting unculturable bacteria/spores was an important issue that should be more clearly highlighted in the response. It was suggested that, in general, the response could be strengthened in several places particularly in relation to the importance of potential by-pass. The Defra representative highlighted that animal by-product rules had been in existence for some time and the issue of AD and TSE risks may have been previously considered by the Spongiform Encephalopathies Advisory Committee (SEAC). It was also noted that, although by-pass is a critical issue, the opportunities for by-pass are limited compared to compost as AD uses a sealed system. The Defra representative undertook to confirm with colleagues whether SEAC had previously considered the issue.

65. The Committee approved the draft response (members who had made specific comments on the draft response were asked to submit their amendments to the Secretariat). The Secretariat was requested to finalise the paper by correspondence before forwarding it to WRAP.

Update on Social Science Research

66. Mrs Robyn Polisano (Social Science Research Committee secretariat) and Mrs Joy Dobbs, deputy Chair of the Social Sciences Research Committee (SSRC) attended the May ACMSF meeting to provide an update on Social Science Research of relevance to ACMSF.
Mrs Polisano gave an overview of the evidence review of food safety behaviours in the home which had originated from ACMSF's request for work to help identify behaviours that might be putting the over 60s at risk of listeriosis.[50] Mrs Polisano explained the work was relevant to a wider range of pathogens and population groups and highlighted the key findings. An update on wave two of the "Food and You" Survey was given. The survey measures public attitudes, knowledge and behaviours towards food over time. Some of the potential food safety risks highlighted from wave one included fridge temperatures, adherence to date labelling and washing of raw meat.

67. A brief overview was given on the in-home kitchen practices study, which will use an ethnographic approach to look at kitchen practices in 18 UK households, and a quantitative survey on consumer attitudes to raw meat decontamination treatments. Mrs Polisano also highlighted SSRC's paper on presenting uncertainty in risk assessments which provided some advice on practical issues, noting that SSRC were keen to engage with others to consider how some of the issues might be addressed early in any planned work.

68. The following questions and comments were made in discussions:

- A Member queried how the 18 homes taking part in the kitchen practices research had been selected. Mrs Polisano explained that they were households that had responded to the Agency's "Food and You" Survey that had indicated they would be happy to be involved in future research. It was acknowledged that these households and the results were not intended to be representative of the whole UK population but the aim of the work was to look in detail at practices in the home.

69. A Member highlighted similar work studying in-home food safety behaviours carried out by Safefood in Ireland. Different approaches to population sampling, methods for achieving a good response level and the limitations and challenges associated with behaviours research were discussed.

Epidemiology of Foodborne Infections Group

70. The FSA updated the Committee on the outcome of the Epidemiology of Foodborne Infections Group (EFIG) meeting which took place on 10 November 2011.[51] The FSA outlined the key points from the 2011 animal data, noting that reports of *Salmonella* associated with animals were lower than in previous years. Of the monophasic *Salmonella* Typhimurium reports DT193 was the predominant phage type. Monophasic strains had become more frequent in pigs over last few years. An Animal Health and Veterinary Laboratories Agency study to characterise monophasic strains using genome sequencing will be presented to EFIG at a future meeting. In terms of human data, laboratory reports of *Campylobacter* continued to increase in 2011 and reports of *Listeria monocytogenes* continued to decline. There was an increase in VTEC O157 PT8 reports which was mainly attributed to the 2011 outbreak associated with leeks and potatoes sold loose.

71. EFIG also discussed the results of a study in Wales to look at the *Campylobacter* sampling rate and positivity rate over a number of years which suggested that the rise in incidence up to 2008 may be in part due to a sampling artefact, but the 2009-10 data could not be explained by an increase in sampling rate alone. The number of *Campylobacter* outbreaks per year now exceeds the number of *Salmonella* outbreaks, with chicken liver pâté the most commonly attributed food vehicle. EFIG also received updates on the second Infectious Intestinal Disease study, Defra's antimicrobial resistance co-ordination group, FSA's official controls review and HPA food, water and environment microbiology laboratories work, including an ongoing survey of lightly cooked food such as chicken liver pâté and sous-vide products.

72. Members made a number of comments on the EFIG update:

- The lack of denominator data was raised and it was noted this makes interpretation of the animal and human data presented difficult. It was highlighted that some of the animal data comes from reactive incidents and some from national control plan sampling and it is therefore difficult to know what to set as the denominator data. Defra do publish separate detailed Salmonella data annually. Similarly, for the human data potential denominators could include samples taken or presentations to GPs but this type of data is not readily collected. The FSA representative noted that EFIG had considered ACMSF's request for denominator data at previous meetings and discussed the issue at length but is a very difficult problem to resolve and in some cases

investment would be needed to gather the data. The issue was however on EFIG's horizon.

- The level of precision quoted in some of the animal data estimates may not reflect the confidence that can be placed in the estimate given the sample size and the lack of denominator data.
- No information on the number of *Campylobacter* outbreaks was presented. It was noted that *Salmonella* outbreaks have decreased over recent years and *Campylobacter* outbreaks have increased but *Salmonella* outbreaks tended to be bigger.
- It was highlighted that the number of *Listeria* reports is continuing to decrease and there may be a benefit in trying to understand why.

73. The Committee welcomed the update but highlighted the need for denominator data to be provided with human and animal data updates. Although Members acknowledged the challenges in being able to provide denominator data, it was noted that there was difficulty in understanding the confidence around the estimates presented and knowing if the reported increases or decreases were statistically significant.

General Papers

ACMSF Work plan

74. The quinquennial review of the ACMSF (report published in March 2011) made a recommendation that the Committee should improve the process for determining its work programme and publish a forward workplan. In May Dr Rollinson (ACMSF Secretariat) outlined a proposed process for agreeing a workplan with the Committee, periodically reviewing and updating the plan and publishing it on the ACMSF website.[52] Two alternative formats for the ACMSF workplan were presented, one with items presented for each meeting chronologically and one with items presented by topic, giving an indicative timescale for consideration. It was noted that the workplan would be a living document with the flexibility to be amended and updated as the Committee frequently dealt with reactive issues that arose at short notice. Members were asked to comment on and approve the process for agreeing the workplan and indicate which draft format they preferred.

75. Members agreed the second workplan format was preferable, with items presented by topic, as this would be easier to update and would give a broader overview of topics to be considered. It was confirmed that the

Secretariat would update the workplan between Committee meetings and provide the plan as a standing item information paper at meetings. It was suggested that the workplan include information on the expected output for each item to be considered and also the outcome of any Committee reports or advice.

76. The ACMSF Chair asked the Secretariat to make the suggested changes to the workplan and noted that presenting items by individual topics was the Committee's preferred format.

Code of Practice for Scientific Advisory Committees

77. In May Mr Adeoye (ACMSF Secretariat) updated Members on the 2011 revised Code of Practice for Scientific Advisory Committees (CoPSAC).[53] It was reported that the revised CoPSAC published in November 2011 was intended to provide a guidance framework for scientific advisory committees and interaction with their sponsoring bodies. Although the Code had been restructured there were no substantial changes to the guidance. The revisions addressed ambiguities and gaps identified through the consultation exercise. The new entries and changes under each chapter were highlighted for Members who were invited to note the amendments concerning the role and responsibilities of the Chair, Members, Secretariat and Departmental Representatives.

Information papers

78. 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 2012 were:

NO. OF PAPER	NAME OF PAPER	MEETING NUMBER	DATE OF MEETING
ACM/1056	Update from other Scientific Advisory Committees	77th	19 January 2012
ACM/1057	Update on Codex Committee on Food Hygiene	77th	19 January 2012
ACM/1058	Items of possible interest from the literature	77th	19 January 2012
ACM/1059	CERF Horizon scanning newsletter	77th	19 January 2012
ACM/1060	Report on the investigation into the prevalence, distribution and levels of norovirus in oyster harvesting areas in the UK	77th	19 January 2012
ACM/1061	A report for the Alliance to save our Antibiotics – how human health is under threat from over-use of antibiotics in intensive livestock farming	77th	19 January 2012

ACM/1062	FAO/WHO Risk Assessment on Enterohaemorrhagic *Escherichia coli* in Raw beef and Beef Products	77th	19 January 2012
ACM/1070	Update from other Scientific Advisory Committees	78th	29 May 2012
ACM/1071	ACMSF Work plan	78th	29 May 2012
ACM/1072	CERF Horizon scanning newsletter	78th	29 May 2012
ACM/1073	Blackett review of high impact low probability risks	78th	29 May 2012
ACM/1074	ECDC Operational guidance on rapid risk assessment methodology	78th	29 May 2012
ACM/1075	Items of possible interest from the literature	78th	29 May 2012
ACM/1076	FSA Board paper on microbiological safety of raw milk and minutes of Board meeting	78th	29 May 2012
ACM/1077	The microbiological safety of sprouted seeds	78th	29 May 2012
ACM/1078	Summary of Foodborne Viral Infections meeting	78th	29 May 2012
ACM/1079	ACMSF response to the WRAP report on: quality, safety and use of digestate in UK agriculture	78th	29 May 2012
ACM/1080	FSA Workshop on Enterohaemorrhagic *E. coli* (EHEC) colonisation and supershedding in cattle		Information paper circulated in September 2012

ACM/1081	Food Safety Week 2012 Evaluation		Information paper circulated in September 2012
ACM/1082	Update from other Scientific Advisory Committees		Information paper circulated in September 2012
ACM/1083	CERF Horizon scan		Information paper circulated in September 2012
ACM/1084	Annual Report of Incidents		Information paper circulated in September 2012
ACM/1085	Botulism Outbreaks and Toxin Types in Cattle, Sheep and Goats, 2011		Information paper circulated in September 2012
ACM/1086	Progress of proposals to amend legislation relating to sprouted seeds		Information paper circulated in September 2012
ACM/1087	Health Effects of Climate Change in the UK 2012 Current evidence, recommendations and research gaps		Information paper circulated in September 2012
ACM/1088	Science Governance in the FSA		Information paper circulated in September 2012
ACM/1089	ACMSF Forward Work Plan 2013/14		Information paper circulated in September 2012

ACMSF Working and *Ad Hoc* Groups

Ad Hoc Group on Foodborne Viral Infections

79. The *Ad Hoc* Group on Foodborne Viral Infections met four times in 2012. The meetings were used to consider the remit of their terms of reference, gather information and agree the structure of their report. The areas they considered included:

- a proposed molecular method that could potentially detect the infectivity and infectious dose of norovirus from food and environmental samples
- responsibilities of the multi-Agency, cross disciplinary Human Animal Infection and Risks Surveillance group which identifies and provides Government Agencies with advice on new and emerging zoonoses
- current surveillance performed for foodborne disease in the UK, update on VITAL (a European food monitoring programme).
- Outcome of FSA Workshop on norovirus held in January 2013
- recommendations of the EFSA reports on the "Scientific Opinion on an update on the present knowledge on the occurrence and control of foodborne viruses" and the "Scientific Opinion on Norovirus (NoV) in oysters: methods, limits and the control options"
- a recent paper on the thermal inactivation of Hepatitis E in pork products.
- issues of viruses and consumer awareness
- the minimum data set requirements for norovirus surveillance
- the structure the Group's report

80. Summaries of the above meetings are available on the ACMSF website.

Ad Hoc Group on Raw, Rare and Low Temperature Cooked Foods

81. *Ad Hoc* Group on Raw, Rare and Low temperature Cooked Foods met four times in 2012. The issues they considered include:

- scope of the group's work and terms of reference
- work plan
- some definitions (low temperature cooking, sous vide, rare) microbiological data requirements
- bacterial behaviour and sous vide food safety

- data on the prevalence of pathogens in food served raw, rare or cooked at low temperature, data on the heat inactivation of foodborne pathogens
- data on the disease burden in the community
- outbreak data linked to raw, rare, low temperature cooked foods
- demonstration of sous vide cooking,
- data on outbreaks,
- *Campylobacter* data, growth and death data of organisms,
- information on types of sous vide of machines and technology used and trends in the sale of sous vide machines/waterbaths, information from the vacuum packaging report,
- existing guidance and current recommendations for low temperature cooking conditions, recipes and types of food cooked using sous vide and information from other countries.

82. Summaries of the above meetings are available on the ACMSF website.

Ad Hoc Group on Vulnerable Groups

83. The *Ad Hoc* Group on Vulnerable Groups met once 2012. The subgroup considered comments received in response to the public consultation on its report: Risk profile in relation to toxoplasma in the food chain. Responses received were generally supportive. The full Committee approved the publication of the report together with the response to the consultation comments. The report was published in September 2012. The FSA is considering the recommendations included in the report and will publish an action plan responding to the report's recommendations in due course.

Newly Emerging Pathogens Working Group

84. The Newly Emerging Pathogens Working Group met once in 2012. They concluded their consideration of foodborne health risks associated with bleeding calf syndrome also known as Bovine Neonatal Pancytopaenia (BNP). [54]

85. In May the Chair of the group (Prof Peter Williams) informed the Committee that the Group had met twice to consider the issue, in 2010 and in 2012 and in between these meetings a significant amount of new research had been published which was helpful to the group's discussions. The Group had concluded that the microbiological risk through the food chain, associated with BNP was negligible. The principal hypothesis developed in the scientific community was that the disease had an immunological basis and the Group therefore considered the immunological risks, recognising they were at the limits of their remit and expertise. Prof Williams outlined the factors considered by the Group in

assessing the levels of BNP associated alloantibodies that may be present in meat and milk. The Group concluded that, within the limits of their remit, the immunological risk to human health from BNP affected animals was very low but they recommended that their report is sent to a committee with the appropriate specific immunological expertise for consideration.

Surveillance Working Group

86. The Surveillance Working Group did not meet but provided comments on the FSA's draft protocols for surveys on *Campylobacter* in chicken and *Listeria* in cooked meats via correspondence. The FSA used the comments in further development of the surveys.

ACMSF Contribution to Consultations

87. In October ACMSF contributed to Department of Health's technical engagement on the new UK five year antimicrobial resistance strategy [and action plan]. This strategy and action plan is in development and is expected to be published in September 2013.

Outcome and Impact of ACMSF advice

88. The quinquennial review recommended that completed ACMSF work should be summarised in terms of outcomes and impact achieved. In considering this recommendation the Committee agreed that where ACMSF recommendations result in a reconsideration of FSA risk management advice the outcomes and impact will be reported in the annual report.

89. The Committee's views have previously been sought on food safety advice in relation to fresh produce. In 2012 the FSA sought the Committee's views whether to undertake research on the internalisation of foodborne pathogens in plant hosts and any implications for advice on their safe preparation. The Committee identified research needs and these included further work to determine the prevalence, concentration and viability of pathogens (including viruses) in fresh produce in both field and experimental conditions and research to look at the fate of these organisms after harvesting. It was also recommended that where fresh produce is implicated in outbreaks of disease it may be possible to investigate if pathogens had been internalised in the produce. Further investigations to look at variations with different plant species types, growth conditions and phenotypic response was also recommended by the Committee. Research recommendations were noted by the FSA and used to inform the development of research requirements to address some of these areas. Requirement for research to investigate the risk from internalisation of pathogens in commercial situations will be published in 2013.

90. ACMSF *Ad Hoc* Group on Vulnerable Groups produced a risk profile in relation to *Toxoplasma* in the food chain. It was forwarded to the FSA in May 2012 and published in September 2012. The FSA is considering the recommendations included in the report and will publish an action plan responding to the report's recommendations in due course. FSA actions in relation to recommendations on research and advice is ongoing.

91. The Committee was asked to comment on the FSA's workshop report on "understanding of the factors that lead to EHEC colonisation in cattle and the role of super shedding in the transmission and maintenance of infection" (ACM/1080), the recommendations and agreed research priorities. ACMSF broadly supported the report's recommendations and agreed with the outlined research priorities. Others issues were drawn to the FSA's attention and ACMSF's comments will be used by FSA Scotland in shaping their ideas and plans going forward.

92. The Committee was asked to note the activity and results from the FSA Food Safety Week (ACM/1081) and comment on the conclusions made. ACMSF's comments were welcomed by the Agency's Communications Team.

Chapter 3: A Forward Look

Future work programme

93. The Committee will keep itself informed of developing trends in relation to foodborne disease through its close links with the Food Standards Agency and the Health Protection Agency. A continuing task will be to respond promptly with advice on the food safety implications of any issues, which may be referred to the Committee by the FSA.

94. The *Ad Hoc* Group on Foodborne Viral Infections are aiming to produce their report: risk profile in foodborne virus by summer 2013.

95. The *Ad Hoc* Group on Raw, Rare and Low Temperature Cooked Foods who are assessing the microbiological risks to consumers associated with use of low temperature cooking/slow cooking, foods of animal origin served raw and foods of animal origin served rare are also aiming to produce their report in 2013.

96. 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.

97. The Working Group on Newly Emerging Pathogens will continue to keep a watching brief on developments concerning the risks to human health and CTX-M extended–spectrum beta-lactamase (ESBL) producing *E.coli* in the food chain.

98. Details of the Committee's work plan for 2013/14 can be found at Annex II.

Annex I

Papers Considered by ACMSF in 2012

NO. OF PAPER	NAME OF PAPER	MEETING NUMBER	DATE OF MEETING
ACM/1047	Matters arising	77th	19 January 2012
ACM/1048	Horizon scanning	77th	19 January 2012
ACM/1049	ACMSF risk assessment	77th	19 January 2012
ACM/1050	ACMSF response to the WRAP risk assessment on Quality, safety and use of digestate in UK agriculture	77th	19 January 2012
ACM/1051	The microbiological safety of sprouted seeds	77th	19 January 2012
ACM/1052	ACMSF Work plan	77th	19 January 2012
ACM/1053	Epidemiology of Foodborne Infections Group	77th	19 January 2012
ACM/1054	Code of practice for Scientific Advisory Committees	77th	19 January 2012
ACM/1055	Date of future meetings	77th	19 January 2012
ACM/1056	Update from other Scientific Advisory Committees	77th	19 January 2012
ACM/1057	Update on Codex Committee on Food Hygiene	77th	19 January 2012
ACM/1058	Items of possible interest from the literature	77th	19 January 2012
ACM/1059	CERF Horizon scanning newsletter	77th	19 January 2012
ACM/1060	Report on the investigation into the prevalence, distribution and levels of norovirus in oyster harvesting areas in the UK	77th	19 January 2012

ACM/1061	A report for the Alliance to save our Antibiotics – how human health is under threat from over-use of antibiotics in intensive livestock farming	77th	19 January 2012
ACM/1062	FAO/WHO Risk Assessment on Enterohaemorrhagic *Escherichia coli* in Raw beef and Beef Products	77th	19 January 2012
ACM/1063	Matters arising	78th	29 May 2012
ACM/1064	Internalisation of pathogens by fresh produce	78th	29 May 2012
ACM/1065	ACMSF risk assessment	78th	29 May 2012
ACM/1066	Update on Social Science Research	78th	29 May 2012
ACM/1067	Risk profile in relation to toxoplasma in the food chain	78th	29 May 2012
ACM/1068	Statement on Bovine Neonatal Pancytopenia	78th	29 May 2012
ACM/1069	Summaries of ACMSF sub-group meetings	78th	29 May 2012
ACM/1070	Update from other Scientific Advisory Committees	78th	29 May 2012
ACM/1071	ACMSF Work plan	78th	29 May 2012
ACM/1072	CERF Horizon scanning newsletter	78th	29 May 2012
ACM/1073	Blackett review of high impact low probability risks	78th	29 May 2012

Annex II

ACMSF Forward Work Plan 2013/14

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.

ACMSF Terms of reference

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

	Topic	Progress	Expected Output
1	**Horizon scanning** The Committee considered horizon scanning at its January 2011 meeting. Four areas were considered based on cross-cutting themes, these were: risks presented by changes in underlying agricultural, sourcing, processing and production factors. The Committee agreed to prioritise consideration of changing food preparation techniques in the hospitality sector that may impact on microbiological food safety.	In January 2012 ACMSF catering Members presented the Committee with their findings on this topic. Following consideration of the ACMSF catering members' findings the Committee referred the issues that emerged from its discussions to a subgroup for further deliberation. The subgroup on raw, rare and low temperature cooked foods is currently considering the issue and expects to produce a paper by September 2013.	An ACMSF paper assessing the microbiological risk to consumers associated with changing food preparation techniques in the hospitality sector. Paper will be forwarded to the FSA for consideration.

	Topic	Progress	Expected Output
2	**Use of source segregated composts and anaerobic digestates in UK agriculture. Waste and Resources Action Programme (WRAP) reports**	ACMSF provided comment on WRAP's report on the use of source segregated composts in agriculture at its September 2010 meeting. A revised version of the report will be provided for ACMSF approval in June 2013. ACMSF received a presentation on WRAPs risk assessment on the quality, safety and use of digestate in UK agriculture in September 2011. The Committee has responded to the report, providing specific comments.	A response from the ACMSF on the WRAP risk assessment reports. Responses will be forwarded to WRAP.
3	**Foodborne Viral Infections**	*The Ad Hoc* Group on Foodborne Viral Infections are currently gathering evidence for their report. The subgroup is expected to present its draft report to the Committee by June 2013.	An ACMSF report on foodborne viral infections highlighting risks to consumers and identifying any research and surveillance gaps. Report and recommendations will be forwarded to the FSA.

	Topic	Progress	Expected Output
4	**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 Working Group on Newly Emerging Pathogens will continue to keep a watching brief on developments concerning the risks to human health and CTX-M extended-spectrum beta-lactamase (ESBL) producing *E.coli* in the food chain.	The Committee to draw the FSA's attention to any risk to human health from ESBL producing *E.coli* in the food chain.
5	**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.	Continuous.	Surveillance Working Group comments on survey protocols and survey results for consideration by FSA in their microbiological food surveillance programme.

	Topic	Progress	Expected Output
6	**Developing trends in relation to foodborne disease** The Committee receives updates on research, surveys, investigations, meetings and conferences of interest.	As issues arise EFIG[1] updates will be provided at the January and June 2013 meetings. An update on the outcomes of the workshop on the Application of Molecular Epidemiology to Investigations of Outbreaks will be provided in January 2013. The results of research to estimate the burden of foodborne disease will be presented to the Committee in June 2013. FSA report on the Olympics and public health outcomes will be provided to the Committee in January 2013.	ACMSF comments on the updates it receives for the FSA's consideration.
7	**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	As issues arise.	ACMSF to note updates and provide comments if desired.

[1] Epidemiology of Foodborne Infections Group

	Topic	Progress	Expected Output
	international level on microbiological food safety, such as EFSA opinions and Codex food hygiene meetings.		
8	**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.
9	**Antimicrobial resistance**	The Committee will be updated on developments and emerging issues in relation to antimicrobial resistance in January 2013.	ACMSF assessment on whether the Committee should revisit this issue. ACMSF published a report on microbial antibiotic resistance in relation to food safety in 1999.
10	**Q fever in unpasteurised milk and milk products**	The Committee will be asked to review a risk assessment on the health risks from Q fever and unpasteurised milk and milk products in June 2013.	ACMSF comments on the research and endorsement of the risk assessment output.

Annex III

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

Terms of reference

ACMSF

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.

Ad Hoc Group on Vulnerable Groups

To examine the potential risks to vulnerable groups including the elderly in relation to the microbiological safety of food by:

- considering factors that make people vulnerable in order to define vulnerable groups in relation to foodborne disease;
- identifying key hazards for key vulnerable groups for review;
- assessing the impact of changing patterns of food consumption and behaviour on risks to these groups;
- assessing/reviewing the value/adequacy of current advice and controls and whether it is appropriate;
- advising the ACMSF on the need for changes in advice/recommendations on vulnerable groups and identifying gaps/research needs.

Ad Hoc Group on Foodborne Viral Infections

- Assess the extent of viral foodborne infection in the UK – with particular reference to norovirus and hepatitis E. Including discussion on the issues surrounding emerging risks.

- Describe the epidemiology, sources and mode of transfer of foodborne viral infection.

- Agree a framework outlining the key criteria for assessing the foodborne risks posed by viruses.

- Review the recommendations from the 1998 report and the Governments' responses.

- Identify practical options that might exist, or be developed, for the prevention and control of foodborne transmission. Including communication strategies to target the industry and consumers.

- Assess the implication of new technologies for public health and control of foodborne viruses.

- Identify data gaps and research priorities where it would be valuable to have more information.

- Report on these matters by January 2013.

Ad Hoc Group on Raw, Rare and Low Temperature Cooked Foods

To assess the microbiological risks to consumers associated with:

- the use of low temperature cooking/slow cooking
- foods of animal origin served raw
- foods of the animal origin served rare

and to identify any gaps in the data that would assist in a risk assessment. Scope: any sector that uses low temperature/slow cooking or produces raw and/or rare food.

Membership Tables

		ACMSF	Surveillance Working Group	Newly Emerging Pathogens Working Group
Chairman				
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	✓	✓	✓
Members				
Dr G Adak	Head of Gastrointestinal Infection Surveillance, Department of Gastrointestinal, Emerging & Zoonotic Infections, Health Protection Services Colindale	✓	✓	
Mr J Bassett	Team Leader, Microbiological Safety, Unilever Safety & Environmental Assurance Centre	✓		
Dr R Betts	Head of Food Microbiology, Campden BRI	✓	✓	
Mrs V Buller	Catering Adviser. School Food Consultant Service Improvement Consultant	✓		
Professor J Coia[2]	Consultant Microbiologist, NHS Greater Glasgow and Clyde	✓	✓	

[2] Chair of Surveillance Working Group

		ACMSF	Surveillance Working Group	Newly Emerging Pathogens Working Group
Mrs R Glazebrook	Consumer representative	✓		
Professor J Gray	Consultant clinical scientist, Specialist Virology Centre, Norfolk and Norwich University Hospitals	✓		
Professor R E Holliman	PHE Lead Public Health Microbiologist for London. Professor of Public Health Microbiology, St George's, University of London. Consultant in Clinical Microbiology, at St George's, Barts & the Royal London Hospitals.	✓		✓
Ms J Hopwood	Company Microbiology, Marks & Spencer	✓	✓	
Professor D McDowell	Professor of Food Studies University of Ulster	✓	✓	✓
Mr P McMullin	Senior Veterinarian & Managing Director, Poultry Health Services	✓		✓
Dr S Millership	Consultant in Communicable Disease Control, Essex Health Protection Unit and Consultant in Microbiology, Princess Alexandra Hospital, Harlow	✓		
Mr D Nuttall	Catering Manager Harper Adams University College	✓		
Mrs J Morris	Principal Policy Officer (Food), Chartered Institute of	✓		

	Environmental Health			
Professor P H Williams[3]	Professor of Microbiology, Dept. of Genetics, University of Leicester	✓		✓
Assessors				
Mr S Wyllie	Department for Environment, Food and Rural Affairs	✓		✓
Ms Liz Redmond	Food Standards Agency	✓		
Dr Susanne Boyd	Food Standards Agency (Northern Ireland)	✓		
Dr J McElhiney	Food Standards Agency (Scotland)	✓		
Mr S Wearne	Food Standards Agency (Wales)	✓		
Secretariat				
Administrative Secretary Ms G Hoad	Food Standards Agency	✓	✓	✓
Scientific Secretary Dr P E Cook	Food Standards Agency	✓		
Administrative Secretariat				
Dr S Rollinson	Food Standards Agency	✓	✓	✓
Mr A Adeoye	Food Standards Agency	✓	✓	✓
Miss S Butler	Food Standards Agency	✓	✓	✓
Scientific Secretariat				
Mr Adam Hardgrave	Food Standards Agency		✓	

[3] Chair of Newly Emerging Pathogens Working Group

		***Ad Hoc* Group on Vulnerable Groups**	***Ad Hoc* Group on Foodborne Viral Infections**	***Ad Hoc* Group on Raw, Rare and Low Temperature Cooked Foods**
Members				
Mr J Bassett		✓		
Dr R Betts[4]				✓
Mrs V Buller				✓
Professor J Coia		✓		
Mrs R Glazebrook			✓	
Dr R Holliman[5]		✓		
Ms J Hopwood			✓	✓
Prof D McDowell				✓
Dr S Millership			✓	
Mrs J Morris		✓	✓	✓
Mr D Nuttall				✓
Professor S J O'Brien[6]			✓	
Co-opted Members				
Dr D Brown	Health Protection Agency		✓	
Dr E Guy	Toxoplasma Reference Unit, Public Health Wales	✓		
Mr Paul Hutchinson	Animal Health and Veterinary Laboratories Agency	✓		
Dr N Cook	Food and Environment Research Agency		✓	
Dr D Lees	Centre for Environment, Fisheries & Aquaculture Science		✓	

[4] Chair of the *Ad Hoc* Group on Raw, Rare and Low Temperature Cooked Foods
[5] Chair of *Ad Hoc* Group on Vulnerable Groups
[6] Chair of *Ad Hoc* Group on Foodborne Viral Infections

		***Ad Hoc* Group on Vulnerable Groups**	***Ad Hoc* Group on Foodborne Viral Infections**	***Ad Hoc* Group on Raw, Rare and Low Temperature Cooked Foods**
Assessors				
Mr S Wyllie	Department for Environment, Food and Rural Affairs	✓	✓	
Secretariat				
Administrative Secretariat				
Dr S Rollinson		✓	✓	
Mr A Adeoye		✓	✓	
Miss S Butler		✓	✓	
Scientific Secretariat				
Dr D Cutts			✓	

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	
Mr J Bassett	Unilever plc	Employee	None	
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
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 J Gray	None		None	
Professor R E Holliman	Public Health England St George's, University of London	Employee Employee	None	

Member	Personal interests		Non-personal interests	
	Name of company	**Nature of interest**	**Name of company**	**Nature of interest**
Mr J Hopwood	Marks & Spencer plc BRC Micro Working Group Campden BRI Governance Research Committee	Employee Member Member	None	
Professor D McDowell	University of Ulster Agrifood Bioscience Institute	Employee Deputy Chair	Companies in food processing/retail FSA	Consultancy/Research funding with industry 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
Mr P McMullin	Poultry Health Services (PHS) Ltd	Employee and shareholder	Various through PHS Ltd	Consultancy, Veterinary care, Laboratory services
Dr S Millership	None		None	

Member	Personal interests		Non-personal interests	
	Name of company	**Nature of interest**	**Name of company**	**Nature of interest**
Mrs J Morris	Chartered Institute of Environmental Health Whitbread plc	Employee and Member Shareholder	None	
Mr D Nuttall	Harper Adams University College	Catering Manager		
Professor P H Williams	None		None	
***Ad Hoc* Group on Foodborne Viral Infections**				
Dr D Brown	None		Various	HPA industry-funded research and laboratory investigations
Dr N Cook	None		None	
Dr D Lees	None		None	
***Ad Hoc* Group on Vulnerable Groups**				
Dr E Guy	None		None	
Mr P Hutchinson	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 Scotland and Wales), the Department for Environment, Food and Rural Affairs, and the Agri-Food & Biosciences Institute, Northern Ireland. 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 are 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 is 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 eg. :

(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 COMMITTTEES

PREAMBLE

Guidelines 2000: Scientific Advice and Policy Making[7] 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 Committees*[8] (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*[9] 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.

[7] Guidelines on Scientific Analysis in Policy Making, OST, October 2005. Guidelines 2000: Scientific advice and policy-making. OST July 2000
[8] Code of Practice for Scientific Advisory Committees, OST December 2001
[9] 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:

Advisory Committee on Animal Feedingstuffs[10]
Advisory Committee on Microbiological Safety of Foods
Advisory Committee on Novel Foods and Processes
Advisory Committee on Research
Committee on Carcinogenicity of Chemicals in Food, Consumer Products and the Environment[11]
Committee on Mutagenicity of Chemicals in Food, Consumer Products and the Environment[12]
Committee on Toxicity of Chemicals in Food, Consumer Products and the Environment[13]
Scientific Advisory Committee on Nutrition[14]
Spongiform Encephalopathy Advisory Committee[15]

These committees share important characteristics. They:

- 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

[10] FSA Secretariat
[11] Joint FSA/HPA Secretariat, HPA lead
[12] Joint FSA/HPA Secretariat, HPA lead
[13] Joint FSA/HPA, FSA lead
[14] Joint FSA/DH Secretariat
[15] 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

1. 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

2. 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.

9. 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 Researcher[16].

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.

[16] 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).

14. Any assumptions made by the committee will be clearly spelled out, and, in reviews, previous assumptions will be challenged.

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

Anaerobic digestation: a process of controlled decomposition of biodegradable materials under managed conditions where free oxygen is absent, at temperatures suitable for naturally occurring mesophilic or thermophilic anaerobe and facultative anaerobe bacteria species, which convert the inputs to a methane-rich biogas and whole digestate.

Bacillus cereus: A type of bacteria that produces toxins. These toxins can cause two types of illness: one type characterized by diarrhoea and the other, called emetic toxin, by nausea and vomiting.

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, neurotoxin-producing obligate anaerobic bacterium. Associated with infant, wound and foodborne botulism.

Escherichia coli O157*:* A particularly virulent type of *Escherichia coli* bacteria that can cause severe illness.

Gentamicin: Is an aminoglycoside antibiotic, used to treat many types of bacterial infections, particularly those caused by Gram-negative organisms.

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.

Mycobacterium bovis: The bacteria which causes tuberculosis in cattle. *M bovis* can also cause tuberculosis in humans.

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 and pathogenic bacteria, which is highly toxic for other living organisms.

Toxoplasma: A parasitic protozoan which causes toxoplasmosis in humans.

Tuberculin: Extracts of *Mycobacteria* used in skin testing in animals and humans to identify a tuberculosis infection.

Typing: Method used to distinguish between closely related micro-organisms.

VITAL: A €3.87M EU-supported project which will provide Europe with a framework for monitoring and risk modelling, and procedures for control of foodborne virus contamination, which will be applicable to any virus, whether existing, emerging or re-emerging, that poses the danger of being transmitted by food.

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

COC: Committee on Carcinogenicity

COM: Committee on Mutagenicity

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

EHEC: Enterohaemorrhagic *E. coli*

ESBL: Extended-spectrum beta-lactamase

FOI: Freedom of Information

FSA: Food Standards Agency

GACS: General Advisory Committee on Science

GAP: Good Agricultural Practice

HPA: Health Protection Agency

OCPA: Office of the Commissioner for Public Appointments

PCR: Polymerase Chain Reaction

SEAC: Spongiform Encephalopathies Advisory Committee

SSRC: Social Science Research Committee

STEC: Shiga-toxin producing *Escherichia coli*

TSE: Transmissible Spongiform Encephalopathy

VTEC O157: Vero cytotoxin-producing *Escherischia coli* O157

WRAP: Waste and Resources Action Programme

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