Advisory Committee on the Microbiological Safety of Food

Annual Report 2013

Advises the Food Standards Agency on the
Microbiological Safety of Food

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References

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[1-21] and in a series of subject-specific reports.[22-38]

Foreword

1. I am pleased to present the twenty-second annual report of the Advisory Committee on the Microbiological Safety of Food (ACMSF). I hope you will find this report and the information it contains useful in finding out about the work of the Committee covering 1 January to 31 December 2013.

2. In January the Food Standards Agency (FSA) brought the issue of antimicrobial resistance (AMR) to the Committee. As ACMSF has previously examined the contribution of the food chain to the problem of AMR, the FSA updated the Committee on recent developments in this area and asked us to consider whether there are any particular areas where further investigation is needed. Following consideration the Committee noted that because food chain aspects were not adequately covered in the various ongoing work on AMR, a subgroup should be established to consider AMR in relation to food chain issues.

3. Members commented on the Ad Hoc Group on Foodborne Viral Infections report's recommendations in relation to short, medium and long term priorities.

4. We received a presentation on the findings of a project to investigate the effect of freezing chicken livers on *Campylobacter* numbers. We were reminded that there had been an increase in reported human outbreaks of *Campylobacter* associated with chicken liver pâté or parfait in recent years. We agreed that freezing could be considered a risk reduction measure and the FSA should consider appropriate messaging to ensure that consumers/caterers were not confused over freezing advice.

5. The Committee was asked to review the risk classification for the human health risk associated with consumption of meat from animals with evidence of *M. bovis* infection. We agreed that it would be valuable for the FSA to restructure the assessment using the *M. bovis* and raw milk risk assessment framework and to document the associated uncertainties before the Committee reconsidered the risk classification.

6. The FSA sought the Committee's views on the subject of Q fever risk to humans from the consumption of contaminated unpasteurised milk and milk products. Following consideration we agreed that contaminated unpasteurised milk was the lesser of the known

infection routes for Q fever. We noted that the link between Q fever and unpasteurised milk and milk products had not be proven.

7. The Ad Hoc Group on Raw, Rare and Low temperature Cooked Foods presented their report on the assessment of 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 welcomed the report as we were content with the scope of the report, the data gaps identified and the prioritised further work on time temperature profiles for common organisms.

8. The FSA brought to our attention the issue of preparation of powdered infant formula (PIF) highlighting that the Department of Health were seeking further advice on safe preparation of PIF with respect to microbiological risks. We pointed out that the important factor was controlling growth of bacteria in the formula and that this could be controlled by making up PIF with freshly boiled water which would reduce any contamination present in the PIF or on the associated equipment.

9. We considered the outcome of the FSA's molecular epidemiology workshop. The report presented to the Committee underlined that the use of molecular epidemiology in the investigation of foodborne disease outbreaks was a rapidly developing area and the falling costs of sequencing together with the development of new technology is having an impact on many areas of microbiology. We noted the importance of sequence data in risk assessment as well as outbreak investigation and the need to consider adapting the systems and the results generated alongside the current legislation.

10. The ACMSF Waste and Resources Action Programme (WRAP) subgroup had considered WRAP's revised compost and anaerobic digestate risk assessments which incorporated changes in response to ACMSF's previous comments and also considered new work procured by WRAP as a result of ACMSF comments. The Committee endorsed the response drafted by the subgroup.

11. The Committee was updated on the review of science governance in the FSA and the implications for Scientific Advisory Committees (SACs).

12. Looking to the future, the Committee will monitor closely developments regarding AMR and the food chain via its newly established working group on AMR. The Committee will ensure that it receives regular updates from the Working Group and publish them on the website. We will report on the work of the Ad Hoc Group on Foodborne Viral Infections. We will continue to continue to consider the risks posed by *Campylobacter, E.coli, Listeria, Salmonella* and

Toxoplasma in food. We will also undertake horizon scanning to identify potential future microbiological risks.

13. 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 second Annual Report of the Advisory Committee on the Microbiological Safety of Food and covers the calendar year 2013.

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[38], the guidance issued by the Office of the Commissioner for Public Appointments (OCPA)[39] and the Government Office for Science Code of Practice for Scientific Advisory Committees[40]. 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 2013

6. The periods of appointments for Professor Sarah O'Brien (ACMSF Chair), Mrs Vivianne Buller, Mr Paul McMullin, Professor Rick Holliman and Professor John Coia expired on 31 March 2013. Mr Paul McMullin was re-appointed for a further 1 year from 1 April 2013 until 31 March 2014. Mrs Buller was reappointed for a further 2 years from 1 April 2013 until 31 March 2015, Professor Holliman was re-appointed for a further 3 years from 1 April 2013 until 31 March 2016, Professor Coia reappointed for 4 years until 31 march 2017 and Professor O'Brien (ACMSF Chair) re-appointed for 4 years until 31 March 2017.[41]

Committee and Sub-Group meetings

7. The full Committee met thrice in 2013 - on 31 January, 27 June and 3 October. All the meetings were chaired by Professor Sarah O'Brien and were open to members of the public.

8. The Working Group on Antimicrobial Resistance (Chair: Professor David McDowell) met thrice 2013. Summary of meetings are at paragraphs 21 to 27.

9. The *Ad Hoc* Group on Foodborne Viral Infections (Chair: Professor Sarah O'Brien) met four times in 2013. The meetings were used to work on their report which they expect to publish for public consultation (see paragraphs 29 to 37).

10. The *Ad Hoc* Group on Raw, Rare and Low Temperature Cooked Foods (Chair: Dr Roy Betts) four times in 2013. Outline of the meetings can be found at paragraph 53 to 62.

11. The Surveillance Working Group (Chair: Professor John Coia) provided comments on the FSA's microbiological survey of Listeria contamination of sliced meats in Small and Medium Enterprises.

Current membership and Declarations of Interests

12. 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[42]. Declarations made are recorded in the minutes of each meeting.

Personal liability

13. 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

14. 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/

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

    acmsf@foodstandards.gsi.gov.uk

16. 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

17. Following the recommendations flowing from the FSA's Review of Scientific Committees[43], the ACMSF decided that from 2003 onwards all of its full Committee meetings should be held in public.

18. All of the 2013 Committee meetings were held in Aviation House, the FSA's London Headquarters.

19. 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

20. The Secretariat provided Members with regular reports of the work of other Scientific Advisory Committees advising the FSA in 2013. 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 2013

Antimicrobial resistance

21. In January the FSA brought the issue of antimicrobial resistance (AMR) to the Committee[44]. Members were provided with the background to the Committee's previous discussions on AMR and were updated on recent developments. Members were reminded that the Committee published a report on antimicrobial resistance in the food chain in 1999 and that the majority of the report recommendations had now been taken forward, either by FSA or other government departments. The need for a co-ordinated government approach to antimicrobial resistance was highlighted, as a range of departments, groups and organisations are responsible for different linked areas. Department of Health (DH) lead on human medicine and Defra and Veterinary Medicines Directorate (VMD) lead on control and use of drugs in animal medicine. The FSA's role is complementary to Defra's and FSA has responsibility for assessing whether current agricultural practices may lead to a deleterious effect on public health via the food chain. It was noted that DH will be publishing a new UK five year Antimicrobial Resistance Strategy and action plan.

22. The FSA reported that there has been recent wider interest and action in relation to antimicrobial resistance at the EU and international levels. A number of emerging issues were also highlighted with updates on Meticillin Resistant *Staphylococcus aureus* (MRSA), Extended-Spectrum Beta-lactamases (ESBLs), Carbapenems and Fluoroquinolones. A brief outline of current food surveillance for antimicrobial resistance was given.

23. Miss Johnson (VMD) gave a presentation on VMD's activities in relation to antimicrobial resistance. She outlined the legislation relating to prescription and advertising of veterinary medicines and guidelines relating to the responsible use of medicines on farm. It was noted that there was a lot of current activity at UK, EU and international level on antimicrobial resistance and VMD's involvement and activities in these areas was highlighted. VMD's policy is the promotion of the responsible use of veterinary antimicrobials to protect public health, animal health and welfare and to ensure continuing availability of veterinary medicines. Brief summaries of five current issues in relation to antimicrobials were given, which included MRSA, ESBLs and *Campylobacter*. Miss Johnson outlined some potential restrictions on the use of antimicrobials that may be imposed by EU legislation in the future.

24. The Committee noted that it was asked to; comment on progress in understanding the issue in relation to the food chain since the ACMSF's 1999 report and subsequent reviews (in 2005 and 2007); identify the key risks to the food chain which may have consequences

for human health and highlight key research or surveillance gaps in relation to the food chain. Prof Stephen Forsythe (ACAF member) and Prof John Threlfall (microbiology expert) who were invited to attend the meeting were invited to join discussions.

25. The following comments were made in discussions:

- The issue of AMR has become more severe over time and patients who cannot be treated with available antibiotics are now seen more frequently.
- The importance of a “one health” approach was highlighted with the need to look at how the environment, animals and humans interact. The scope of the issue should not ignore infection control and preventing the dissemination of resistant organisms, the role of infected food handlers in spreading resistant organisms and the role of the environment.
- It was queried whether resistant organisms behave in the same way as non-resistant types and whether existing food hygiene controls also work with respect to resistant organisms. It was noted that there is some evidence that resistant organisms tend to grow more slowly and therefore may be more resistant to environmental stresses and also more likely to accumulate multiple drug resistances.
- Safefood are planning to look at the prevalence of ESBL organisms in the foodchain in beef, pork and chicken.
- Microbiolgical surveillance may need to take account of developments in molecular methods for tracking transfer of resistant elements, both within and between species. Currently used phenotypic methods are not good at detecting resistance or its underlying mechanisms.
- It was highlighted that a recent EFSA report called for rewriting of veterinary Cephalosporin-based medicine labels across the EU. This has been implemented in the UK and labels now state that use of the medicine should not be population based.
- It was clarified that the British Poultry Council (BPC) voluntary ban on the use of certain antibiotics relates to use in day old chicks only.
- Paper ACM/1091 (that the FSA used to introduce this topic) identified some gaps in the knowledge base and identified which of ACMSF’s recommendations made in 1999 are still outstanding. There may be merit in revisiting these to check their current relevance.
- The ACAF member (Prof Forsythe) noted that he was here to ensure a chain of communication between the two Committees on the issue of AMR as this was currently under discussion by both Committees. It was suggested that there is often confusion amongst the public on the differing regulations in different countries relating to use of antimicrobials in animals.

- The importance of environmental seeding with AMR organisms via human sewage was highlighted. Animals may then be exposed to these resistant organisms in the environment and can pass infection back to humans.
- A new EFSA mandate to look at Carbapenem resistance in food animal ecosystems has been issued. Carbapenems are not known to be used in food animals but cases of resistant organisms in animals have been identified.

26. The Committee noted that many groups were already doing a lot of work on AMR and therefore duplication should be avoided. However, as foodchain aspects were not being discussed in detail in other UK fora a small group should be established to consider AMR and foodchain issues with relevant external expertise, to ensure appropriate weight is being given to food safety. Prof Coia, Prof Holliman, Prof Forsythe and Mr McMullin were asked to be on the group and Prof McDowell was asked to Chair it.

27. The Defra representative offered to check any terms of reference for the group with the Defra Antimicrobial Resistance Co-ordination Group (DARC) terms to ensure there was not a significant overlap and suggested the groups could feed back to each other. It was also noted there was a list of research on AMR which could be made available.

Update on viruses in the food chain

28. Prof Sarah O'Brien presented the draft report from the foodborne viral infections subgroup[45]. She clarified that the report was not intended as a full risk assessment but was an update on 'state of the art' with respect to foodborne viruses.

29. The ACMSF published their first report on foodborne viral infections (FVI) in 1998. This report considered viral foodborne illness, sources, occurrence, detection, contamination and routes of transmission. The report also discussed the prevention and control measures for foodborne viruses which manifest in humans as gastroenteritis or viral hepatitis (ACMSF, 1998).

30. Since the publication of the 1998 ACMSF report on FVI, with the exception of minor risk assessment work carried out on hepatitis E and avian influenza, no formal review has been undertaken on foodborne viruses. Therefore, at the March 2010 ACMSF meeting members agreed that an *Ad Hoc* Group should be set up to revisit the issue of foodborne viruses in light of the significant developments in this area, so that an up-dated risk profile could be produced based on the findings.

31. Although all foodborne viruses, including new and emerging viral pathogens, were considered in the update, the *Ad Hoc* Group identified

that the most important viruses associated with foodborne infection were norovirus, hepatitis A virus and hepatitis E virus. These viruses are the focus of the group's report which concentrates mainly on viral foodborne infection in the UK.

32. The report also gives consideration of two recent comprehensive reviews of viruses in food that have been published by the WHO (2008) and EFSA (2011). The report provides key information which will be used to inform Risk Assessments and Risk Management on foodborne viruses across government.

33. The report was presented as a near final draft and a few sections were awaiting finalisation. As the report had been circulated to members at short notice it was noted that detailed comments were not expected, the intention of the discussion was to agree a process for finalising a draft for public consultation.

34. Prof O'Brien reminded members of the terms of reference for the group and outlined the main sections of the report and the data considered, this included the characteristics of the main viruses of concern (norovirus, Hepatitis E and A), detection of viruses in food, burden of disease, risk factors for infection, outbreak and surveillance data, investigation of foodborne virus outbreaks, contamination of foods via an infected handler and contamination of fresh produce and of shellfish. In relation to outbreaks it was highlighted that the groups understanding was that food businesses should alert their Local Authority immediately when they are aware that they have potential foodborne virus outbreak, however it appears this is not being done.

35. The report makes 44 recommendations and Prof O'Brien requested that Members provide their views on the priority of recommendations in relation to short, medium and long term priorities. Comments on the draft report were requested by 18th October. It was noted that comments would be incorporated into the report which would be subject to a public consultation. The aim was to issue the consultation in November and to have post-consultation draft at the January 2014 ACMSF meeting.

36. Members noted that the report represented a large and significant body of work and therefore it was important to consider it in more detail. It was noted that the terms of reference included agreement of a framework for outlining the key criteria for assessing the foodborne risks. Prof O'Brien agreed that that the report should be more explicit in saying that table 2 in paper ACM/1121a was important in that regard.

Freezing chicken livers and *Campylobacter*

37. In June the Committee was briefed on the findings of a project to investigate the effect of freezing livers on *Campylobacter* numbers[46]. Members were reminded that there had been an increase in reported

human outbreaks of *Campylobacter* associated with chicken liver pâté or parfait in recent years, thought to be linked to the undercooking of livers. The FSA had commissioned research to look at interventions that may help in reducing the risk from these products, including a project on the effect of freezing livers on *Campylobacter* numbers. Members were asked to consider the study findings and comment on:

- Whether application of the findings could contribute to reducing the risk of campylobacteriosis from imperfectly cooked chicken livers or chicken liver products?
- Whether there are other factors (ingredients, treatments) which could help reduce *Campylobacter* contamination in chicken livers with or without freezing?
- Possible further research arising from these findings.

38. Dr Mike Hutchison was invited to present the findings of the study. A small number of samples of frozen and fresh raw livers were collected from retail premises. The mean *Campylobacter* counts in frozen livers were found to be significantly lower than those measured in fresh livers. Livers were collected from final clearance flocks in slaughterhouses to increase the probability they were contaminated with *Campylobacters*. The livers were subjected to different freezing treatments by varying the rates and durations of freezing and the number of freeze treatments. The rates of freezing were chosen to represent the worst-case conditions achievable in a domestic freezer towards the end of its working life and the best-case conditions in a catering freezer. Freezing to either -15°C or -25°C was attempted. The freezer set to -15°C was only able to freeze the livers to -11°C after 24 hours. Freezing to -11°C or -25^{o}C for 24 hours was found to significantly reduce the numbers of campylobacters on the livers compared with unfrozen livers. The freezer set to -15°C was able to lower the temperature of the livers to -15°C by 48h. Freezing for one week at -15°C gave a further significant reduction in *Campylobacter* numbers compared with the 24h freeze. Two freezes to -25°C gave the biggest reduction in *Campylobacter* numbers (up to three logs).

39. In discussion the Committee made the following comments on the research project:

- It was clarified that chest freezers and upright freezers were used in the study. The different types of freezer froze the livers at different rates. Both the surface area to volume ratio of livers and rate of freezing affected *Campylobacter* viability.
- The length of time taken to reach the desired low temperature (i.e. the rate of freezing) was important since that affected *Campylobacter* viability. A rapid rate of freezing was more important than the lowest temperature reached.
- There are two bactericidal mechanisms operating during freezing. When freezing rates were low, patches of frozen water formed in

the extracellular water. As that ice formed, it expelled dissolved ions into the unfrozen water, increasing its osmotic potential. As the ionic strength of the extracellular water became more concentrated, it began to remove water from the cytoplasm of the *Campylobacter* cells. When freezing was rapid, ice crystal formation was the main method for *Campylobacter* population decline.

- Dr Hutchison responded that the rate of freezing was a critical parameter that was much faster in the -25°C freezer where the damage to cells was probably due to ice crystal formation.
- The study showed that freezing could be a useful intervention to reduce *Campylobacter* but there were still several important questions on the effect of variables such as rate of freezing and time between defrosting and re-freezing. It was agreed that recommendations to freeze livers might lead to some confusion for consumers and caterers if they were advised to freeze livers twice as the general advice is not to refreeze foods once defrosted.
- In response to a question, Dr Hutchison clarified that no work was done in this project on any organoleptic changes to the livers as a consequence of freezing. Dr Hutchison stated his recollection was that, after two freezes, the livers produced more exudate but they weren't 'mushy'. Mrs Rowswell added that FSA were in the process of commissioning further work to look at the production of pâté and parfait and sensory testing to investigate organoleptic issues.
- Members were informed that in the last two years there had been a decrease in the number of *Campylobacter* outbreaks associated with chicken liver pâté, with 15 outbreaks in 2011, 6 in 2012 and one to date in 2013. It was suggested that some of prosecutions that had taken place in relation to catering premises and chicken liver pâté might have had an effect on catering practices.
- It was queried whether the use of essential oils in pâté/parfait preparation had been considered. It was clarified that the project scope was only to assess the implications of freezing.
- It was noted that a risk assessment model created by EFSA for general chicken meat reported that a two-log reduction in *Campylobacter* numbers would give a significant reduction in human foodborne disease cases. The size of the reduction achieved by freezing livers was an important and useful piece of work. Were *Campylobacter* levels contaminating livers reduced by freezing, there would also be an additional potential benefit of reduced cross-contamination from the livers during preparation in kitchens.

40. ACMSF ex-officio (Deputy Chair SSRC) who provided written comments on this item queried the factors underlying the increase in outbreaks linked to chicken liver pâté and questioned whether this was due to increased consumption of chicken liver pâté, increased food poisoning risk per serving or greater propensity to undercook livers. If

the cause was related to behaviour changes then research to analyse and understand that behaviour might identify interventions to modify it.

41. In summary the Committee acknowledged that freezing could be considered a risk reduction measure and FSA should consider appropriate messaging to ensure that consumers/caterers were not confused over freezing advice. The research had raised some questions over variables, such as the rate of freezing, time between freezes, and effect on organoleptic properties. The use of essential oils in pâté and parfait preparation could also be considered.

Mycobacterium bovis and the possible health risks associated with meat

42. Prof David McDowell chaired this item. Members were asked to review the risk classification for the human health risk associated with consumption of meat from animals with evidence of *M. bovis* infection[47]. This had been considered by the Committee in 2012 and agreed as very low risk. The background to previous ACMSF risk assessments on this issue was summarised and the recent EFSA opinion on meat inspection (bovines), which classified the risk from *M. bovis* and meat as negligible, was referenced. It was noted that enhanced human surveillance for *M. bovis* in the UK has been maintained and there is a continuing absence of evidence of human infection from meat despite the increase in *M. bovis* in cattle.

43. Members queried whether meat, in the context of this risk assessment, included muscle and the other parts of the carcase. There was also discussion on the definitions of risk classification terms, the difference between very low and negligible and how consumers might perceive these terms. Members queried what difference it made in practice if the risk classification was changed from very low to negligible and whether this would lead to a relaxing of controls. The FSA departmental representative explained that changing the risk classification did not necessarily mean there would be any change in policy or existing controls. The current controls in the UK derived from EU-wide legislation, and the EFSA opinion would be used to inform an EC review on meat inspection procedures. The request to the Committee to review the classification was more an issue of risk communication and trying to be consistent in the way that risks were represented using the terminology agreed by ACMSF.

44. Members agreed that it would be worthwhile to restructure the assessment using the *M. bovis* and raw milk risk assessment framework and to document the associated uncertainties before the Committee reconsidered the risk classification. FSA requested the opportunity to seek the Committees' view on the risk assessment question prior to undertaking any redrafting of the document and

agreed to clarify the scope of the assessment with respect to meat and other organs.

Q fever, raw milk and raw milk products

45. In June the FSA briefed the Committee on the issue of Q fever, raw milk and raw milk products[48]. The FSA had commissioned AHVLA to undertake a project to assess the risks to human health from Q fever and unpasteurised milk and milk products. Members were provided with three outputs from the project, namely a risk profile for *Coxiella burnetii* in raw milk and milk products, the risk pathways and a draft exposure assessment.

46. AHVLA gave a presentation on the work completed on the project to date. Dr Emma Snary and Dr Paul Gale presented the work undertaken on the project. Dr Snary outlined the information gathered for the risk profile explaining that Q fever was a zoonotic disease caused by *C. burnetii*, which is endemic in cattle, sheep and goats in the UK. Transmission to humans was mainly through contaminated aerosols from infected animals but there was some strong evidence that contaminated raw milk could also be a source of human infection. Human epidemiology data was presented, including UK outbreak data and Dr Snary highlighted that there had been an increase in the number of reported UK human cases in 2011 (from 55 in 2010 to 112 in 2011). Veterinary epidemiological data was also outlined including data on the seroprevalence of Q fever in UK livestock. It was noted that viable *C. burnetii* had been detected in commercially sold raw milk but not in raw milk products including cheese. Dr Snary noted that there was very limited enumeration and survival data for *C. burnetii* in raw milk and milk products. The risk profile concluded that, compared to other routes, milk and milk products were a minor route of infection. It was suggested this could be because the concentration of *C. burnetii* produced during abortion and present in livestock birth products is much higher than the levels shed in milk and infectivity may be lower through the oral route than the inhalation route.

47. Dr Snary summarised the data gaps identified in the project and noted that these meant that a full quantitative risk assessment was not possible due to a lack of data, in particular on survival and concentration of *C. burnetii* in milk and milk products and dose-response data through the oral route. Dr Snary described the exposure assessment model that had been developed and some draft results from the model, including scenario analysis for a Q fever outbreak. It was noted that exposure is possible and could be occurring frequently but due to the uncertainties associated with the model data, the exposure results are an overestimation, and furthermore the unit of exposure may present a relatively low risk through the oral route. The need for laboratory methods to detect and enumerate viable *C. burnetii* was highlighted.

48. In discussion the Committee made the following comments on the presentation:

- It was confirmed that Q fever is not a notifiable or reportable disease in animals, although there is a legal obligation to report abortions in cattle under *Brucella* legislation. In the case of a high abortion rate in a dairy herd it might be expected that a farmer would want to establish a diagnosis and therefore would report abortions.
- It was noted that human outbreaks appear to be relatively rare and it was queried whether the literature search was restricted to developed countries. Dr Gale clarified that the information and literature found in relation to human outbreaks and cases had tended to focus on the developed world rather than developing world.
- It was queried whether the apparent increase in Q fever cases in 2011 was a true increase or the effect of changes in diagnosis. It was noted that the gold standard method for human diagnosis is immunofluorescence and demonstration of an increase in antibody level. PHE at Porton offer a PCR test for Q fever. It was suggesting the timing of the Netherlands Q fever outbreak may have a had a bearing on the number of samples submitted for testing in 2011 and further investigation of the number of samples submitted may be valuable. Dr Snary noted that the Defra zoonoses report suggested there may have been recent changes in Q fever diagnosis and this was being followed up with PHE. It was also noted that genotyping of isolates is not undertaken.
- A Member commented that the outbreak data reviewed came from acute cases of Q fever. The epidemiology of chronic Q fever cases was queried, including whether the two forms of disease were linked to the two development stages of the organism. It was also suggested that better differentiation of forms was important. Dr Gale commented that there were two variants of *C. burnetii*, small cell and large cell variants. Large cell variants were more fragile and small cell variants were similar to a spore-like form. It was suggested that the organism is less infectious via the oral route than inhalation route because it targets macrophages which are less prevalent in the gut than they are in lung tissue.
- There was discussion on the 50% Guinea Pig intraperitoneal infectious dose ($GP\_IP\_ID_{50}$) unit that was used as the measure of exposure in the exposure assessment and the risk to humans from this via the oral route. Dr Gale suggested that a high number of $GP\_IP\_ID_{50}$ units may be needed to make 1 oral infectious dose 50% for humans and this fits with the observed epidemiology of Q fever in humans.
- It was suggested that dose-response needs to be better elucidated but it was recognised that the time between presentation with

symptoms and diagnosis could be quite long so potential infection sources were unlikely to still be available for testing. Dr Gale noted that there was a lack of recent experimental work on infectious dose. A dose-response experiment had been conducted in the 1940s but no quantification of *C. burnetii* was done and therefore the information could not be used to calculate infectious dose.

- It was suggested that the epidemiological evidence linking consumption of *C. burnetii* contaminated milk with Q fever illness in humans was fairly weak.
- A Member asked whether any work was ongoing to establish a better unit of exposure and whether any sensitivity analysis was planned on the model due to the high number of uncertainties. Dr Snary responded that they were not aware of any current work on exposure units and that sensitivity analysis was planned on all the model variables to include the uncertainties.
- It was suggested that it might be valuable to follow-up regular raw milk drinkers, such as farm workers, to investigate Q fever infection and this could be done via the Gastrointestinal, Emerging and Zoonotic Infections Department at PHE.

49. Written comments provided by Ms Dobbs (ACMSF ex-officio and Social Science Research Committee Deputy Chair). She suggested a number of areas where the SSRC could provide assistance if required, such as on studies to look at the number of people consuming raw milk, amount consumed, type of products consumed and storage of products. Ms Dobbs suggested the SSRC would want to keep a watching brief on this issue as the work progressed and should also consider whether to include questions on consumption of raw milk and milk products in the next Food and You survey.

50. Members were reminded that they had been asked to comment on:

- The evidence that Q fever can be transmitted by unpasteurised milk and milk products.
- The data gaps identified in the risk pathway document, in particular the most significant gaps to address in terms of assisting risk assessment.
- The exposure assessment approach taken.
- Any other approach that would help is assessing the level of risk.

51. Following discussions the Committee noted that the link between Q fever and unpasteurised milk and milk products could be considered not proven. It was agreed that unpasteurised milk was one of the less significant of the known infection routes. It was noted that there were many data gaps that would hinder the risk assessment and most of these need to be addressed. Improving laboratory methods, human diagnoses and follow-up of raw milk drinkers, using a sentinel approach were underlined as important. It was also pointed out that it was

important to clarify if the recent increase in human cases was an artefact related to changes in diagnostics or a true increase. The Committee observed that the exposure assessment approach used seemed pragmatic in the circumstances and there were no particular improvements recommended on the approach taken. In conclusion the Committee remarked that the report should be explicit in stating the literature search criteria and in explaining which milk products were included and excluded from the scope and why.

Raw, rare and low temperature cooked foods

52. Dr Roy Betts (Chair of the *Ad Hoc* Group on Raw, Rare and Low Temperature Cooked Foods) briefed the Committee on the work of the *Ad Hoc* Group on Raw, Rare and Low Temperature Cooked Foods[49]. Dr Betts explained that the group had met eight times over 15 months and reminded members of the terms of reference for the group and the scope of their work.

53. Dr Betts explained that there was no agreed definition of low temperature cooking and the group had therefore developed their own definition. He noted that FSA defines an adequate cook as application of 70°C for 2 minutes or an equivalent time/temperature to destroy pathogens. Equivalent processes for lower temperatures have been defined using standard calculations. For temperatures between 55°C and 59°C published information indicates that, if applied for a sufficient time, these temperatures should reduce any vegetative organisms present to safe levels but more data is needed to define safe cooking times between these temperatures. At temperatures below 55°C consideration needs to be given to growth of *Clostridium perfringens* as some data suggests it is able to grow at 52°C. Low temperature cooking raises several issues which could conflict with current regulations and advice such as the possibility that foods will be cooked at a lower temperature than that currently recommended for hot-holding of foods (62°C) and the possibility that meats could remain pink in the middle when safely cooked at low temperatures. These issues require some further consideration.

54. In relation to consumption of raw meats the group had considered that there would always be an associated increased microbiological risk but the foodborne illness outbreak data reviewed did not show any evidence of outbreaks associated with raw meat dishes in the UK. This could be due to the low volumes consumed and under-reporting of illness. Human illness due to inadequate cooking of meats had however been reported in UK outbreak data. In relation to meats served rare there were several processes that could increase the risk of internal contamination such as mincing of the meat. The cooking advice given in the 2007 ACMSF burgers report was considered by the group to still be relevant although the group also discussed the ‘sear

and shave' method for preparation of burgers and further work on this approach was recommended to fully understand the risks.

55. Dr Betts directed members to the group's recommendations in the paper and the Chair invited members to comment on:

- The content and scope of the paper
- the appropriateness and priority of the recommendations
- the risks to consumers associated with use of low temperature cooking and foods of animal origin served raw or rare
- the data gaps/research needs identified and the significance of these
- any further work the Committee may wish to do on this topic or areas they may wish to explore in more detail e.g. fish/seafood, viruses, protozoa.

56. Members suggested that inclusion of a glossary would be a helpful addition to the paper. Some of the limitations around the ability of outbreak data to detect the impact of illness due to consumption of raw or rare foods (such as under-reporting of cases) were highlighted and it was suggested that these caveats could be clarified in the relevant section of the paper.

57. There was discussion on the perception that existed in some areas that using 'higher quality' meat meant there was less likely to be any microbiological contamination present. It was noted that some VTEC outbreaks linked to undercooked burgers are reported and these are often linked to 'high end' premises. It was suggested that there is a view amongst some food businesses that high value meat can be equated with 'high quality' and this is taken to mean that the product is safe, this view does not take account of the various points in the food chain where microbiological contamination can occur such as transport from the abattoir to the point of processing. Dr Betts clarified that the evidence examined by the group did not detail what was considered 'high quality' meat. Some members of the group were not comfortable with the 'sear and shave' technique suggested for burger production and suggested it was not practical for production of large volumes. The group recommended that this technique should be further investigated in terms of its ability to control the potential risks. Other Committee members did not share these concerns if the final product was treated as any other ready-to-eat food. It was noted that many burgers are made from meat trimmings rather than whole cuts of meat and these have a very different microbial profile and commercial value.

58. It was noted that when working with models to calculate z values at low temperatures, in addition to parameter uncertainty there would be model uncertainty as the models had not been validated for use at these lower temperatures. It was also suggested that at lower temperatures there were important considerations in terms of bacterial

population dynamics. A Member agreed to draft some text on this point for the paper.

59. The Committee discussed risk assessment formats and their previous agreement to use a structured framework for risk assessments and why it was not used in this case. The Chair noted that when the group were given the brief for discussions on raw, rare and low temperature cooked foods the Committee may not have been clear about the type of output expected and whether the report would turn into a formal risk assessment or a discussion around the important issues. The direction of the draft document was now clearer but it was noted that it would be a significant amount of work to populate a formal risk assessment framework with this information. The Chair asked whether the Committee wanted this doing. It was noted that in many instances there was insufficient data to populate a risk assessment. The discussions of the group had helped in clearly identifying where this data was lacking and could be considered a first step in the risk assessment process. It was agreed in this case not to populate a risk assessment framework.

60. In discussing the prioritisation of recommendations made in the paper Members agreed the priority should be further work on establishing and using z values for common organisms for low temperatures cooking. It was noted that these had already been established for *E.coli* in the burgers report. In terms of extending the considerations of the group to commodities other than meat it was agreed the Committee should take the learning and recommendations from this report and when there is a better handle on the outcome revisit the issue of other commodities and micro-organisms such as fish, shellfish and protozoa.

61. Members were content with the scope of the report and the data gaps identified and endorsed the prioritised further work on time temperature profiles for common organisms. The Secretariat/subgroup were asked to make the identified amendments to the paper and for the final version to be submitted to the FSA.

Safe preparation of powdered infant formula

62. In June the FSA (Dr Paul Cook) brought the issue of preparation of powdered infant formula to the Committee explaining that the Department of Health were seeking further advice from the FSA on safe preparation of powdered infant formula (PIF) with respect to microbiological risks[50]. The current UK recommendation was to prepare standard PIF using hot water (70°C or above). The Committees' views on the relative risks of different preparation, storage and feeding scenarios were sought.

63. The FSA outlined the main microbiological hazards associated with infant formulae. These were *Cronobacter* spp, which was mainly associated with sporadic cases and *Salmonella enterica* which was

generally associated with outbreaks. *Cronobacter* was the primary organism of concern. Infection with *Cronobacter* is rare but serious. Between 1992 and 2012 there were 36 reports of isolation of *Cronobacter* from blood or CSF from infants less than 12 months in England and Wales. The source of these infections was not known.

64. Dr Cook highlighted that, despite what many care-givers believe, PIF is not a sterile product and controlling *Cronobacter* during manufacture is challenging and contamination may occur at very low levels. It was noted that feeds are not always consumed straight after preparation and may be stored for some time and there is nothing intrinsic in the powdered formula that would prevent growth of *Cronobacter* or other bacteria if reconstituted formula was not stored at appropriate temperatures. Dr Cook noted that a risk assessment model for *Cronobacter* in PIF has been developed by FAO/WHO and this on-line model was used to explore the effect of varying parameters such as preparation temperature, storage time and feeding duration on the risk from *Cronobacter* in PIF. The model gives a relative measure of risk reduction as its output. Members were asked to comment on:

- The information provided regarding microbiological hazards associated with powdered infant formula, its preparation and use.
- The risk reduction achieved by different preparation scenarios using the FAO/WHO model and their relative importance.
- The conclusion that the reconstitution of PIF with water at 70^{o}C can make a significant contribution to risk reduction from i) intrinsic contamination of PIF and, ii) extrinsic contamination arising from equipment and the preparation environment.

65. The Committee covered the following points in discussions:

- It was noted that the output is exposure reduction rather than risk reduction. Exposure and risk are correlated but the increments may be smaller. It was suggested that this may reduce the utility of comparisons on exposure risk between scenarios.
- Dr Cook clarified there was no dose response information available for infants and *Cronobacter* and it was difficult to know what levels infants were exposed to when illness was identified as the reconstituted formula was often no longer available for testing.
- Using a risk ratio approach generates greater uncertainty as there is uncertainty in both the numerator and denominator. This makes the output difficult to interpret except at very low and high temperatures.
- The recommendation to use water at 70°C may create confusion as many people don't know what this means in practice and how to achieve it. It may be more helpful to recommend use of boiling water. It was clarified however, that because of concerns with handling boiling water and the effect on vitamins use of boiling

water to make up PIF is not currently advised. Current advice aims is ensure that PIF is reconstituted with freshly boiled water which is no lower than 70^{o}C.

- It was suggested that when access to freshly boiled water is not available e.g. on long journeys, people follow different practices. Some make up formula and transport it for later use and some transport boiled water for making up formula as needed, the risks are different for these different scenarios. It was suggested that this is an area where social science may have a role in looking at consumer behaviour. Dr Cook noted that some research had been done to look at this, in terms of temperature tracking and behaviour. It was also suggested that the most important thing is probably controlling growth rather than the kill, so making formula up with water at ambient temperature is probably less of a risk than making formula up with water at 50°C and storing it before feeding.
- It was suggested that advice should be that PIF is made up with hot water and if it has to be stored it should be chilled as soon as possible. Advising consumers that PIF is microbiologically unstable and should be treated as other foods in terms of temperature control could be helpful and simple advice.
- Based on the figures in the paper it was noted that making up with water at 70°C significantly reduced viable *Cronobacter* numbers.
- In relation to extrinsic contamination it was noted that if freshly boiled water was used any contamination on the equipment should be destroyed.
- It was suggested that where advice on long held practices is changed the effect on micro-organisms other than the target organism should also be considered.

66. In conclusion it was noted that although some Members had concerns over certain aspects of the model, it was agreed that the important factor was controlling growth of bacteria in the formula. Growth could be controlled by making up PIF with freshly boiled water which would reduce any contamination present in the PIF or on the associated equipment.

Application of molecular epidemiology to investigation of foodborne disease outbreaks

67. In January 2012 the FSA held a workshop on the Application of Molecular Epidemiology to Investigations of Foodborne Disease Outbreaks: Current Status and Future Plans[51]. The workshop's report was presented to the Committee in January 2013. Report highlighted that the use of molecular epidemiology in the investigation of foodborne disease outbreaks was a rapidly developing area and the falling costs of sequencing coupled with the development of new technology, mean

it is having an impact on many areas of microbiology. The workshop focused on outbreak investigation and a few of the key points covered are outlined below.

68. Meeting participants recognised the potential for Next Generation Sequencing (NGS) in outbreak investigation. They encouraged the agencies involved to apply such approaches to future foodborne outbreaks, including the analysis of food and environmental isolates where these are available.

69. Whilst historical isolates were recognised as an important resource and reference point it was felt that sequencing of such collections does not need to occur before applying sequencing technologies to new isolates. When sequencing of historical isolates is being considered the focus should be on isolates where sequencing is likely to add value. Gaps in knowledge in animal populations also need to be considered.

70. Standardisation is needed particularly as the adoption of sequencing technologies becomes more widespread and identifying sources of variability and uncertainty between the different methodologies will be important. Standardisation is also important for other information collected (clinical, animal, food, environmental) and ideally such information should not be collected retrospectively.

71. Members were asked to comment on the report and the relative importance of the different issues raised and also to identify any gaps not highlighted which were relevant to the application of this technology to microbiological food safety.

72. The following comments in discussions:

- The archiving, storage and ability to analyse the sequencing data produced are very important considerations due to the large volume of data being generated. The difficultly in finding bioinfomaticians to analyse sequence data was also raised.
- When designing sequence databases thought should be given to the additional information fields required for each entry as this increases the value of the sequence information.
- It was noted that other polyomic approaches analysing, for example how genes are expressed, will give useful additional information in the future.
- A forthcoming meeting in Copenhagen, addressing both the EU and US approaches to molecular epidemiology, aimed to develop a more global strategy on this issue, looking at issues such as standardisation of databases. An EFSA Biohaz panel working group on the subject has also been established.
- The report focused on outbreaks, which are the hazard identification part of a risk assessment i.e. identifying the organism of concern.

There needs to be some consideration of how 'omics' technologies could help improve the whole risk assessment process, particularly the dose-response element as this can be a more complex part of the process. There has been a recent International Life Sciences Institute initiative looking at use of these technologies to understand how organisms behave in the environment and interact with humans to help in getting a better handle on the level of risk.

- There are a number of operational issues that need to be overcome in implementation such as use of different sequencing systems by different groups, whether data should be held centrally or by individual labs, the role of National Reference Laboratories and data ownership issues.

73. In summary the Committee noted the importance of sequence data in risk assessment as well as outbreak investigation and the need to consider fitting the systems and the results generated into the current legislative structure. The importance of focussing on the overall usefulness and application of the data and concerns in relation to availability of bioinformatics expertise were also noted.

74. Members were provided with a copy of the presentation slides on project: *Applying a molecular epidemiological surveillance approach in investigation of gastrointestinal disease outbreaks* as time was short for the slides to be presented at the meeting.

ACMSF response to WRAP's revised compost and anaerobic digestate risk assessments

75. A subgroup of ACMSF members had met in September to consider the revised Waste and resources Action Programme (WRAP) reports which incorporated changes in response to ACMSF's previous comments and also to consider new work procured by WRAP as a result of ACMSF comments[52].

76. Dr Betts highlighted the main comments the group had made on the revised reports, these included:

- Concerns on the over-precision in some of the risk estimates which implied a greater level of confidence in the results than was perhaps warranted.
- A need for greater transparency on how the range of pathogens had been selected for inclusion in the assessment.
- A lack of operational data on the rates of compliance achieved in practice. It was noted that some of the material may by-pass the pasteurisation step and the group were not confident in the data on the degree of by-pass and the level of compliance with the pasteurisation process. This remained one of the biggest areas of uncertainty due to the lack of data and the reliance on estimates.

- Concerns over consumer acceptability on the use of meat and animal by-products as compost material.
- New work had been procured by WRAP to address previous ACMSF concerns over *Clostridium botulinum*. The group found this work very helpful and it showed that there was no significant accumulation of *C. botulinum* spores in receiving soils following application of composts and digestates. However, with respect to *C. botulinum* toxins the group felt the results were equivocal and didn't provide clear evidence that toxin(s) wasn't produced during the anaerobic digestion process. WRAP had confirmed that a further study on this was being procured.
- In general the group welcomed the changes made to reports and felt the additional work and amendments addressed most of the ACMSF's previous comments. The group were generally satisfied that the microbiological risks arising from the production and use of PAS compliant composts were acceptably low, based on the evidence provided by WRAP to date and assuming full compliance with the statutory requirements.
- It was not possible to come to a conclusion on the risks from *C. botulinum* types C and D as this would require consideration of the further work being procured by WRAP before a firm view could be reached.

77. ACMSF Chair thanked the group for looking at the reports and recognised this was a large undertaking given the length of the documents. Comments from Committee members were invited.

78. A Member of the WRAP subgroup noted that the risk to operators from spreading digestates and composts had been briefly considered by the group however, at the time of the discussions information on the recent respiratory tract infections in Scotland caused by *Legionella longbechii*, associated with compost was not available. The Defra representative queried whether the comments on by-pass related only to composts as digestates were a sealed system where by-pass should not be possible. Dr Betts noted that the comments applied to both systems as he understood that digestate could be fed into the system and come out again before it had undergone the full process, there was also a time requirement which if shortened could result in by-pass. There was some discussion on whether this constituted by-pass on non-compliance. It was noted that the group were concerned that it was not clear if non-compliance was rare or not and how it was enforced. Dr Betts concluded that the group were happy with the way the assessments had been carried out assuming full compliance with the required processes, however the level of compliance achieved was a risk management consideration which was outside the Committee's remit.

79. The Committee endorsed the subgroups comments and asked for these to be fed back to WRAP.

Epidemiology of Foodborne Infections Group

80. The FSA updated the Committee on the outcome of the Epidemiology of Foodborne Infections Group (EFIG) meetings held in 2012 and June 2013[53 and 54].

81. Members received information on the trends in *Salmonella* prevalence in animals from data collected during 2012 and the first quarter of 2013. It was reported that there had been a reduction in reports of *Salmonella* in cattle, sheep and ducks compared with 2011 and data from pigs was comparable with 2011. Trends in laboratory reports for *Salmonella, Campylobacter, Listeria monocytogenes* and *E.coli* O157 in humans were also reported. Numbers of cases of *Salmonella* infection have continued to fall whilst *Campylobacter* cases are continuing to rise although case numbers in Scotland, Wales and N. Ireland appear to be levelling off. Overall, the number of outbreaks reported in 2012 declined by 35%.

82. The Committee had in previous meetings requested for denominator data to be included in the animal and human data they receive from EFIG. In January and June members received presentations on this issue.

Salmonella Surveillance in Great Britain

83. Miss Lesley Larkin (AHVLA) gave a presentation on *Salmonella* surveillance in Great Britain[55]. She outlined the legislative background to *Salmonella* surveillance in GB and the main data sources that contribute to the Surveillance. Data comes from both statutory *Salmonella* National Control Plans (NCP) for chickens and turkey and from non-statutory passive surveillance, mainly in cattle, sheep and pigs. NCP data provides a relatively reliable prevalence estimate that is flock based, non-statutory surveillance data is reported as incidents and this data lacks reliable denominators. Other monitoring includes voluntary industry monitoring and surveys. The options for defining a suitable denominator for *Salmonella* surveillance data were outlined. These included using the total number of samples submitted, total number submitted for a specific disease, total number of animals/farms or number of submitting farms. The limitations for each option were highlighted. It was noted that the non-NCP data does allow for looking at trends over time and monitoring changes and an early detection system is used to flag for new and emerging strains. It was suggested that, where practical, the best approach in the future may be the use of test-based denominators or the number of farms submitting samples, with suitable quality statements.

84. The ACMSF Chair noted that HPA and AHVLA data are fundamental to the risk assessments that ACMSF carry out and if numerator data

cannot be interpreted it makes risk assessment difficult. ACMSF Chair reminded members that the lack of good denominator data was an issue that had been raised at ACMSF and EFIG several times and asked Members to comment on what the Committee could do to move this forward.

85. The following points were covered in the discussion:

- In response to a query on the use of sentinel surveillance Miss Larkin responded that a project looking at this option had been undertaken but there were difficulties for *Salmonella* as the symptoms were non-specific.
- It was noted that accredited laboratories can provide denominator data if given appropriate notice. Reporting of the number of samples tested and number of positives would be a start but there would be a need to consider the burden on labs for multiple reporting.
- It was noted that there are many similarities with human denominator data issues and the pyramid of ascertainment is analogous to the human situation in that samples tested are not gathered in any systematic way and the figures presented almost certainly underestimate the true prevalence.
- Miss Larkin suggested that because of the inherent biases attempting to use any of the currently available denominator data approaches may be flawed. A survey-based approach may be the most robust way forward with the use of passive surveillance to pick up emerging issues.
- It was suggested that the Committee should always consider the limitations in any assessment it carries out including how the available data affects the validity and certainty of any opinions it gives. Margins for error should be captured in any conclusions when the denominator data is not given and the variation in data is unknown and in some extremes the Committee may be unable to give an opinion if the data is not sufficient. It was also suggested that in some cases the Committee may need to accept that denominator data is not available and this should be noted as a limitation on the assessment and a data gap.
- It was noted that AHVLA are consulting on their surveillance 2014 proposal at present and ACMSF may wish to comment on the issue of denominator data in a consultation response.

86. In conclusion the Committee noted important points about uncertainty around risk assessment and emphasised the significance to have denominator data in order to be able to distinguish real trends in disease from surveillance artefacts.

Surveillance data and denominators for human Infectious intestinal disease

87. Dr Bob Adak gave a presentation on surveillance data and denominators for human Infectious intestinal Disease. He explained that it was the current international industry standard to use population data as the denominator for routine national or regional laboratory surveillance. This allowed comparison of data in an international and cross-disciplinary context in a way that was transparent and consistent and was the approach used in the Chief Medical Officer's annual report. Any change in approach would need to show demonstrable benefits and the requirements for the output of any new approach were outlined. Currently laboratory reports are used as a proxy for illness in the community, in an ideal world the number of people that became infected after exposure would be more informative i.e. the number of symptomatic and asymptomatic cases. A number of alternative denominators for human surveillance were outlined and it was highlighted that the feasibility of collecting centralised data on specimen throughput from clinical laboratories was being investigated. Use of the number of specimens tested for certain pathogens from PHE sentinel laboratories was discussed. Using specimens tested as a denominator might allow for adjustments to account for changes in sampling and testing that might affect laboratory report ascertainment. Several possible scenarios using this approach were outlined.

88. Following discussion, it was suggested that Defra may want to review their processes as one of the frustrations was having data presented in different ways in the same booklet and being misinterpreted. It was noted that one of the big differences between animal and human surveillance is that a lot of foodborne zoonosis don't cause disease in animals and the only way to find out if animals are carrying the organism is to do routine surveillance on healthy animals.

89. Other items EFIG considered in 2013 include:

Epidemiology of *Campylobacter* Infection in Scotland

90. A paper was presented by Health Protection Scotland (HPS) which provided an estimate of the cost of *Campylobacter* infection to the health service in Scotland each year (£1.78M). This is an underestimate of the true cost of infection as HPS had not attempted to consider wider economic costs such as those due to lost productivity associated with time off work either directly through illness or through caring for an ill child, or any indirect costs. Humphrey *et al.,* (2007) (Int J Food Microbiology **117**:237-257.] reported the estimated average cost of a case of acute *Campylobacter* infection (excluding long-term sequelae) in England in 1995 to be £1315. Using this estimate of cost per case would suggest that the health service related costs in Scotland in 2011 would be much higher (£8.4M). Humphrey et al reported that food-borne *Campylobacter* infection costs the UK at least

£65 million per annum with the true figure probably being closer to £500 million.

Campylobacter infection in England and Wales

91. The group received a presentation from the Health Protection Agency on a descriptive study which reviewed one million cases of *Campylobacter* infection in England and Wales from 1989 to 2011. There was an increase in *Campylobacter* cases over this period with the largest increased being in people aged over 50 years. The study concluded that a diverse range of factors influence the *Campylobacter* figures. It was highlighted that the relative importance of seasonality, age distribution, population density, socioeconomic and long-term differences were not fully understood. Surveillance and typing were seen as important in providing insights into *Campylobacter* epidemiology and sources of infection. The study has been published and can be found at: http://www.ncbi.nlm.nih.gov/pubmed/22798256?dopt=Abstract

General Papers

Science Governance in the FSA

92. The Chair invited Dr Patrick Miller to provide an update on the review of science governance in the FSA and the implications for Scientific Advisory Committees (SACs) [56]. Dr Miller outlined the reasons for the review and what it aimed to achieve, noting that the outcome of the review had been presented to the FSA Board in July and agreed. As a result of the review minor changes had been made to the Science Checklist and Good Practice Guidelines (the tool for use by Scientific Advisory Committees). A new framework for iteration and dialogue between SACs and the Agency has been produced to ensure that dialogue is transparent and respects the different roles and responsibilities.

93. Members were invited to make any comments on the paper. The Committee agreed it was useful to be reminded of the guidelines and checklist and appreciated that the process was not overly burdensome. It was noted that the key documents are available on the FSA website. It was suggested that there may be value in having a document listing some of the common errors made by Committees and a facility for capturing feedback on issues that had not gone well or where the Committees advice had been misunderstood or misinterpreted. Dr Miller noted that the aim was to pick these issues up through dialogue with the Committees and after the processes had been in place for a few years it might be appropriate to review the learning, both good and bad.

Information papers

94. 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 2013 were:

NO. OF PAPER	NAME OF PAPER	MEETING NUMBER	DATE OF MEETING
ACM/1097	Science in the Scientific advisory Committees	79th	31 January 2013
ACM/1098	Update from other Scientific Advisory Committees	79th	31 January 2013
ACM/1099	ACMSF Workplan	79th	31 January 2013
ACM/1100 and 1101	CERF Horizon scanning newsletters	79th	31 January 2013
ACM/1102	Item of interest from the literature	79th	31 January 2013
ACM/1103	Codex Committee on Food Hygiene November 2012 meeting	79th	31 January 2013
ACM/1104	Summaries of subgroup meetings	79th	31 January 2013
ACM/1111	FSA work on Listeria	80th	27 June 2013
ACM/1112	Update from other Scientific Advisory Committees	80th	27 June 2013

ACM/1113	ACMSF Workplan	80th	27 June 2013
ACM/1114	ECDC Operational guidance on rapid risk assessment methodology	80th	27 June 2013
ACM/1115	Items of possible interest from the literature	80th	27 June 2013
ACM/1116	FSA Board paper on microbiological safety of raw milk and minutes of Board meeting	80th	27 June 2013
ACM/1117	The microbiological safety of sprouted seeds	80th	27 June 2013
ACM/1118	HPA Olympics Reports	80th	27 June 2013
ACM/1126	Update from other Scientific Advisory Committees	81st	3 October 2013
ACM/1127	ACMSF Workplan	81st	3 October 2013
ACM/1128	Summaries of subgroup meetings	81st	3 October 2013
ACM/1129	Items of interest from the literature	81st	3 October 2013
ACM/1130	Progress report on ACMSF recommendations	81st	3 October 2013
ACM/1131	HPA/LGR co-ordinated food studies	81st	3 October 2013
ACM/1132	Research on domestic practices	81st	3 October 2013

ACMSF Working and *Ad Hoc* Groups

Ad Hoc Group on Antimicrobial Resistance Working Group

95. The Committee received an update on recent developments in relation to AMR and the food chain in January 2013 and agreed to establish a subgroup of members to consider this topic in detail (paragraphs 21 to 27 refers). ACMSF highlighted that the group would ensure that appropriate weight was given to the food chain in relation to discussions and developments on AMR.

96. The Working Group met thrice in 2013. The issues they considered include:

Terms of reference

97. The group discussed their terms of reference and scope. The groups' role will be to assess the risks to humans from foodborne transmission of antimicrobial-resistant microorganisms and provide advice to the ACMSF. Their specific terms of reference are:

- To brief ACMSF on developments in relation to antimicrobial resistance and the food chain and identify evidence that will assist the group in assessing the risks.

- To review key documents and identify the risks for the UK food chain and relevant aspects of the feed chain in relation to antimicrobial resistance which may have consequences for human health.

- To comment on progress in understanding the issue of antimicrobial-resistant microorganisms and the food chain since the ACMSF produced its report in 1999 and subsequent reviews in 2005 and 2007, including the relevance of any outstanding recommendations.

- To highlight key research or surveillance gaps in relation to antimicrobial-resistant microorganisms and the food/feed chain and identify those which are considered a priority.

Outstanding recommendations from ACMSF 1999 report on AMR

98. Members reviewed the outstanding recommendations from ACMSF's 1999 report on Microbial Antibiotic Resistance in Relation to Food Safety and discussed whether these were still relevant. They related to two main areas:

- Gaps in the knowledge base with regards to the prevalence of antibiotic resistance in commensal microorganisms found in food (particularly *E. coli* and enterococci)
- Gaps in Government funded research on antibiotic-resistance bacteria in imported food and animal feeding stuffs and in the area of microbiological risk assessment.

99. The group noted that 14 years have elapsed since the report had been published and since then a lot of work has been undertaken. This has meant that some of the recommendations may be out of date and in some cases may no longer be applicable. In addition some recommendations may need updating or re-framing, for example in light of developments in newly-developed, genomic sequence-based methods for identifying resistance genes in bacterial populations.

100. The role of commensals has been identified as important in spreading resistance genes to pathogens. This has been highlighted in a 2011 EFSA Opinion on the public health risks of bacterial strains producing extended-spectrum β-lactamases (ESBLs) and/or AmpC β-lactamases in food and food-producing animals and also in a series of recent papers from The Netherlands. When the ACMSF 1999 report was being written, methods for detection of resistance would have relied heavily on phenotypic methods including the use of surrogate markers. There is now increased emphasis on tracking the spread of resistance genes between organisms which has been facilitated by the use of molecular methods. Hazards in this area are posed by the presence of resistance genes, and their propensity to “move” (e.g. plasmid/ integron/transposon *versus* nucleus) from the current commensal host.

101. In relation to imported foods the group commented that the relative importance of imported foods to the development of AMR is unknown and it remains a potentially significant source. This is particularly relevant in that such foods may be imported from countries where production is cheaper and antibiotic usage in food animals is less regulated than in the UK, and in other EU Member States.

102. Some antimicrobial resistance gene/organism combinations are spread by the food-borne route and have had significant effects in some areas e.g. *Salmonella* Kentucky in North Africa and Eastern Europe, but not to a significant extent in the UK. Data to understand these patterns and associated risks would be desirable.

103. The new poultry inspection proposals from the Commission include requirements to define the levels of *E. coli* with ESBLS/AmpC-encoding resistance genes.

104. In summary the group considered that AMR in imported food remains an area of concern, and the knowledge gaps in this area need to be resolved to inform risk management.

105. The working group also considered imported feedstuffs and noted there are differences between bacteria in imported animal feed, and in imported feed that is medicated (including water). It was thought that there is little feed that is imported already medicated, but imported feed may be contaminated with resistant micro-organisms. It was considered that it was important to know whether there is an enhanced risk from imported feed and there is still insufficient data to inform assessment of these risks.

106. In relation to the outstanding, and in some cases longstanding, recommendations re AMR (ACMSF 1999, 2005 & 2007) the group noted that some significant gaps in the knowledge base remain. The working group will continue to monitor and report on these gaps, “new gaps”, and re-opening gaps (i.e. areas where the passage of time, and changes in AMR patterns mean that new/additional data is necessary to inform accurate risk assessment).

European Medicines Agency (EMA) advice on colistin and tigecycline

107. The European Commission submitted a request to the EMA for advice on the impact on public health and animal health of the use of antibiotics in animals. The EMA published an opinion responding to this request on 19th July 2013 focussing their advice on colistin and tigecycline.

108. The working group reviewed the EMA documents. The group noted that, in the UK, colistin is frequently used in livestock (pigs and poultry), sometimes in combination with critically-important antimicrobials such as fluoroquinolones and very occasionally used in humans. In the past colistin was not used in human medicine because of its toxicity and because more effective antibiotics were available. The emergence of resistance to other first-line or last resort antibiotics now means that colistin is, in some circumstances, becoming the only effective appropriate human antimicrobial. Colistin resistance has not been demonstrated to be plasmid-mediated, and there is no evidence of horizontal transfer of the resistance gene to other bacteria associated with its use in livestock. Emergence of resistance has been observed after colistin use in humans, but there is no suggestion of any link between animal use and resistance in human. As mentioned above, colistin is sometimes used in combination with other antimicrobials in treatment of livestock, which may be of concern. It was also noted that there have been some reports of low level colistin resistance in *E. coli* and/or possibly some *Salmonella* serovars at non-therapeutic levels. The group agreed that the EMA advice, including removing prophylactic use of colistin in animals and monitoring of off-label use, was proportionate.

109. The group noted that tigecycline is currently unlicensed for use in veterinary medicine, and is therefore not used in the UK. As long as

this restriction remains the group considered that this antibiotic should not pose a significant concern.

Quantification of human deaths due to antibiotic use in chicken

110. The Group considered a letter from Collignon *et al,* published in Emerging Infectious Diseases in August 2013*.* These authors estimated the number of human deaths and hospital admissions in European countries (including the UK) resulting from the presence of third generation cephalosporin-resistant *E.coli* in poultry.

111. The authors used a figure from a study in the Netherlands by de Kraker *et al*. (which estimated the number of human infections with cephalosporin-resistant *E. coli that* could be associated with poultry consumption) to estimate the number of such infections in other European countries. The group expressed concerns over such extrapolation, as there is evidence that:

a) ESBL levels in poultry in The Netherlands are much higher than in the UK
and;

b) cephalosporin usage in The Netherlands was not the same as in the rest of Europe.

112. The working group also noted that a more recent paper by de Kraker *et al* queried some of the initial research findings. Overall, the group also felt that although some of statements in the letter were currently unsubstantiated, they could usefully be further examined. Members noted that the authors should be commended for attempting a quantitative risk assessment, but felt that uncertainties remained in relation to the validity of the data used to calculate the above estimates, along with potential difficulties around the large confidence intervals associated with the estimates.

DH AMR Strategy

113. The group noted that the DH strategy on AMR was due to be published on 10th September and agreed to provide comments on the strategy. They also noted DH's intention to produce a draft implementation plan which they would have the opportunity to comment on at a future meeting. Members were updated on some of the groups being established by DH to help with implementing the AMR strategy and it was suggested that ACMSF may be involved/provide advice to one of the implementation groups.

Identification of Livestock-Associated Meticillin Resistant *Staphylococcus aureus* (LA MRSA) in UK turkeys

114. The group were provided with a press release, research papers and oral update in relation to the recent finding of LA-MRSA in turkeys on a farm in East Anglia.

115. Members were informed that in October 4 turkeys were submitted to an Animal Health and Veterinary Laboratories Agency (AHVLA) lab for diagnosis and Staphylococci were cultured from the lung of one of these birds which proved to be LA-MRSA ST398 *spa*-type t011. The strain was found to be resistant to tetracyclines, penicillins and meticillin but susceptible to a number of other antimicrobials, including macrolides and fluoroquinolones.

116. The group was informed that the strain isolated was common in livestock in continental Europe but had not previously been detected in livestock in the UK. This strain had been isolated in the UK from a few human cases and also detected in horses and in about 5 of 1500 bulk milk samples from dairy herds. In 2007 a survey of UK breeding pigs found that all were negative for this strain.

117. It was noted that AHVLA, Public Health England and the Food Standards Agency had been in liaison over the incident and had issued a press release explaining there was no indication of foodborne transmission of MRSA and the risk of contracting LA-MRSA from eating poultry meat was considered very low. The FSA had also issued a press release reiterating their standard food safety messages about thorough cooking of poultry meat.

118. Following discussion the group concluded that there was little evidence in relation to LA-MRSA in the UK, but the available evidence did not suggest a foodborne issue in the UK or Europe at present. Members agreed to monitor the situation as it develops, both in the UK and in other parts of Europe. The group suggested that inclusion of LA-MRSA in future food surveillance may require consideration.

Research paper on complete genes passing from food to human blood

119. The group were asked for their views on a recent published research paper which suggested that DNA fragments from food consumed by humans can carry complete genes, without degradation into the human circulatory system. This had raised questions over the potential for transfer of resistance genes to human pathogens via food.

120. Following deliberation the group concluded that although the research raised some interesting questions and suggested transfer of genes into the circulatory system was theoretically possible, it was unlikely to pose a significant risk in relation to the public health risks from antimicrobial resistant organisms. However, it was agreed the group should keep a watching brief on any further research in this area.

EFSA Scientific Opinion on the public health risks of bacterial strains producing extended-spectrum B-lactamases and/or AmpC B-lactamases in food and food-producing animals

121. The group considered EFSA's Scientific opinion on the public risks of bacterial strains producing extended-spectrum B-lactamases and/or AmpC B-lactamases in food and food-producing animals.

122. The group observed that one of the research papers cited in the scientific opinion provided evidence of the important link in the transmission of *E.coli* that produce ESBL from poultry to humans. The study revealed that 35% of human clinical ESBL-producing *E.coli* contained ESBL genes that were also detected in *E.coli* from poultry origin. Members did not disagree with the scientific opinion's conclusions and recommendations. It was noted that the report acknowledged the difference in the way screening for ESBL is carried out in the Member States. The group was informed that there was an ongoing push for harmonisation concerning human and animal ESBL surveillance in Europe.

123. Although the scientific opinion was published in 2011, the group agreed that it had highlighted the importance of ESBLs and/or AmpC-producing bacteria in food and food producing animals. Members pointed out that presently there was lack of evidence of the prevalence of ESBL and/or AmpC-producing bacteria in the food chain.

Work plan

124. The group agreed to invite the Veterinary Medicines Directorate (who are the UK policy lead on AMR in relation to animals) to a future of meeting of the group to brief members on current issues. Other issues the group will consider at future meetings include: the outcome of the conference on the EU AMR Action plan, the Department of Health's AMR strategy implementation plan, findings of a microbiological survey of UK pigs in relation to AMR including ESBL *E.coli,* the EFSA opinion on Carbapenemase resistance and, the risks from imported foods.

***Ad Hoc* Group on Foodborne Viral Infections**

125. The group established in 2011. They met four times in 2013 to plan and work on their report and to agree their recommendations, with the aim of presenting a draft report to the main committee in October 2013.

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

126. The group was established in 2012. They met four times in 2013 and the issues they considered include:

- Low temperature cooked foods (heat inactivation data and risk assessment for low temperature cooking)
- Outputs from previous discussions on low temperature cooked foods
- Food served raw or rare
- Low temperature cooking
- Plan and work on their report and to agree their recommendations

127. Group presented their report to the Committee in October 2013 (paragraphs 53 to 62 above refers)

Surveillance Working Group

128. In October the Surveillance Working considered a preliminary report of an FSA microbiological survey of *Listeria* contamination of sliced meats in Small and Medium Enterprises (SMEs). Members provided comments on the survey report that is expected to be published in Summer 2014.

Outcome and Impact of ACMSF advice

129. Feedback on the outcome of ACMSF recommendations are provided to the Committee through matters arising papers, information papers and oral updates at meetings. In 2013 the Committee considered a range of issues which may have an impact on risk management.

130. The FSA sought the Committee's views on the subject of Q fever risk to human health from the consumption of contaminated unpasteurised milk and milk products. The Committee received a presentation on current FSA research commissioned on this issue. ACMSF agreed that contaminated unpasteurised milk was the lesser of the known infection routes for Q fever. It was highlighted that the link between Q fever and unpasteurised milk and milk products could be considered not proven. The Committee also made a number of comments on the research findings and approach which were fed back to the research contractor.

131. The Committee's advice was sought by the FSA on the microbiological risks associated with the preparation of powdered infant formula (PIF). The Committee's advice was used to inform the Department of Health on this issue. A key point made by the Committee was the significance of controlling growth in the reconstituted formula. Growth could be controlled by making up PIF with freshly boiled water which would reduce any contamination present in the PIF or associated equipment.

132. The ACMSF *Ad Hoc* Group on Raw, Rare and Low temperature Cooked Foods produced a paper that assessed the microbiological risk from foods covered by the above category. The paper has been forwarded to the FSA which is considering the recommendations included in the report. The paper identified data gaps and prioritised further research on time temperature profiles for common organisms.

133. The Committee was asked to comment on the FSA's workshop report on "application of molecular epidemiology to investigation of foodborne disease outbreaks" (ACM/1092), the relative importance of the different issues raised and also to identify any gaps not highlighted which were relevant to the application of this technology to microbiological food safety.

134. The Committee considered the findings of a project to investigate the effect of freezing chicken livers on *Campylobacter* numbers. ACMSF agreed that freezing could be considered a risk reduction measure and the FSA should consider appropriate messaging to ensure that consumers/caterers were not confused over freezing advice. The research raised some points which were drawn to the FSA and the research contractor's attention.

Chapter 3: A Forward Look

Future work programme

135. 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 Public Health England. 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.

136. The *Ad Hoc* Group on Foodborne Viral Infections set up to revisit the issue of foodborne viruses in light of the significant developments in this area is aiming to produce its report: An update on viruses in the food chain by Autumn 2014.

137. The Committee through its Working Group on Antimicrobial Resistance will consider antimicrobial resistance and food chain issues

138. 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.

139. The Committee will continue to keep itself informed of Government horizon scanning activities and initiatives, and their potential impact on the ACMSF's future work programme. As the Committee's next horizon scanning review is scheduled for 2014-15, Members will review topics on the short list of priorities from the 2006 short list in the light of emerging issues.

140. Details of the Committee's work plan for 2014/15 can be found at Annex II.

Annex I
Papers Considered by ACMSF in 2013

NO. OF PAPER	NAME OF PAPER	MEETING NUMBER	DATE OF MEETING
ACM/1090	Matters arising	79th	31 January 2013
ACM/1091	Antimicrobial resistance	79th	31 January 2013
ACM/1092	Application of molecular epidemiology to investigation of foodborne disease outbreaks	79th	31 January 2013
ACM/1093	Epidemiology of Foodborne Infections Group	79th	31 January 2013
ACM/1094	Epidemiology of Foodborne Infections Group	79th	31 January 2013
ACM/1095	Science Governance in the FSA	79th	31 January 2013
ACM/1096	Dates of future meetings	79th	31 January 2013
ACM/1097	Science in the Scientific Advisory Committees	79th	31 January 2013
ACM/1098	Update from other Scientific Advisory Committees	79th	31 January 2013
ACM/1099	ACMSF Work plan	79th	31 January 2013
ACM/1100 and 1101	CERF Horizon scanning newsletter	79th	31 January 2013
ACM/1102	Item of interest from the literature	79th	31 January 2013
ACM/1103	Codex Committee on Food Hygiene November 2012 meeting	79th	31 January 2013
ACM/1104	Summaries of subgroup meetings	79th	31 January 2013

ACM/1105	Matters arising	80th	27 June 2013
ACM/1106	Q fever, raw milk and raw milk products	80th	27 June 2013
ACM/1107	Freezing chicken livers and Campylobacter	80th	27 June 2013
ACM/1108	Infant formula	80th	27 June 2013
ACM/1109	Epidemiology of Foodborne Infections Group	80th	27 June 2013
ACM/1110	Dates of future meetings	80th	27 June 2013
ACM/1111	FSA work on Listeria	80th	27 June 2013
ACM/1112	Update from other Scientific Advisory Committees	80th	27 June 2013
ACM/1113	ACMSF Work plan	80th	27 June 2013
ACM/1114	FSA Workshop on foodborne viruses	80th	27 June 2013
ACM/1115	Summaries of ACMSF sub-group meetings	80th	27 June 2013
ACM/1116	Items of possible interest from the literature	80th	27 June 2013
ACM/1117	FAO/WHO Campylobacter report	80th	27 June 2013
ACM/1118	HPA Olympics reports	80th	27 June 2013
ACM/1119	Matters arising	81st	3 October 2013
ACM/1120	Raw, rare and low temperature cooked foods	81st	3 October 2013
ACM/1121	Update on viruses in the food chain	81st	3 October 2013
ACM/1122	*Mycobacterium bovis* and the possible health risks associated with meat	81st	3 October 2013

ACM/1123	ACMSF response to WRAP's revised compost and anaerobic digestate risk assessments	81st	3 October 2013
ACM/1124	Antimicrobial Resistance Working Group	81st	3 October 2013
ACM/1125	Date of future meetings	81st	3 October 2013
ACM/1126	Update from other Scientific Advisory Committees	81st	3 October 2013
ACM/1127	ACMSF Work plan	81st	3 October 2013
ACM/1128	Summaries of subgroup meetings	81st	3 October 2013
ACM/1129	Items of possible interest from the literature	81st	3 October 2013
ACM/1130	Progress report on ACMSF recommendations	81st	3 October 2013
ACM/1131	HPA/LGR co-ordinated food studies	81st	3 October 2013
ACM/1132	Research on domestic practices	81st	3 October 2013

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.

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.

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.

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	As issues arise.	ACMSF to note updates and provide comments if desired.

[1] Epidemiology of Foodborne Infections Group

	EU and 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, its 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 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.

Antimicrobial Resistance Working Group

- To brief ACMSF on developments in relation to antimicrobial resistance and the foodchain and identify evidence that will assist the group in assessing the risks.

- To review key documents and identify the risks for the UK food chain and relevant aspects of the feed chain in relation to antimicrobial resistance which may have consequences for human health.

- To comment on progress in understanding the issue of antimicrobial-resistant microorganisms and the food chain since the ACMSF produced its report in 1999 and subsequent reviews in 2005 and 2007, including the relevance of any outstanding recommendations.

- To highlight key research or surveillance gaps in relation to antimicrobial-resistant microorganisms and the food/feed chain and identify those which are considered a priority.

Membership Tables

		ACMSF	Surveillance Working Group	Newly Emerging Pathogens Working Group
Chair				
Professor S J O'Brien	Professor of Infection Epidemiology and Zoonoses, University of Liverpool, Institute of Infection and Global Health, National centre for Zoonosis Research	✓	✓	✓
Members				
Dr G Adak	Head of Gastrointestinal Infection Surveillance, Department of Gastrointestinal, Emerging & Zoonotic Infections, Health Protection Services Colindale	✓	✓	
Dr G Barker[2]	Senior Research Scientist, Institute of Food Research, Norwich	✓		

[2] From 1 April 2013

		ACMSF	Surveillance Working Group	Newly Emerging Pathogens Working Group
Mr J Bassett	Principal Consultant, John Bassett Consulting Ltd	✓		
Dr R Betts	Head of Food Microbiology, Campden BRI	✓	✓	
Mrs V Buller	Catering Adviser School Food Consultant Service Improvement Consultant	✓		
Professor J Coia[3]	Consultant Microbiologist, NHS Greater Glasgow and Clyde	✓	✓	
Mrs R Glazebrook	Consumer representative	✓		
Professor J Gray	Consultant clinical scientist, Specialist Virology Centre, Norfolk and Norwich University Hospitals	✓		
		ACMSF	Surveillance Working Group	Newly Emerging Pathogens Working

[3] Chair of Surveillance Working Group

				Group
Professor R E Holliman[4]	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 Microbiologist, Marks & Spencer	✓	✓	
Professor D McDowell	Professor of Food Studies University of Ulster	✓	✓	✓
Mr P McMullin	Senior Veterinarian & Managing Director, Poultry Health Services	✓		✓

[4] Chair of Newly Emerging Pathogens Group from April 2013

		ACMSF	Surveillance Working Group	Newly Emerging Pathogens Working Group
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[5,6]	Professor of Microbiology, Dept. of Genetics, University of Leicester	✓		✓

[5] Chair of Newly Emerging Pathogens Working Group until 31 March 2013
[6] Appointment ended 31 March 2013

		ACMSF	Surveillance Working Group	Newly Emerging Pathogens Working Group
Departmental Representatives				
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	✓	✓	✓

		ACMSF	Surveillance Working Group	Newly Emerging Pathogens Working Group
Mr A Adeoye	Food Standards Agency	✓	✓	✓
Miss S Butler	Food Standards Agency	✓	✓	✓
Scientific Secretariat				
Mr Adam Hardgrave	Food Standards Agency		✓	

		Ad Hoc Group on Foodborne Viral Infections	*Ad Hoc* Group on Raw, Rare and Low Temperature Cooked Foods	Antimicrobial Resistance Working Group
Members				
Mr J Bassett				
Dr R Betts[7]			✓	
Mrs V Buller			✓	
Professor J Coia				✓
Mrs R Glazebrook		✓		
Prof J Gray		✓		
Dr R Holliman				✓
Ms J Hopwood		✓	✓	
Prof D McDowell[8]			✓	✓
Mr P McMullin				✓
Dr S Millership		✓		
Mrs J Morris		✓	✓	
Mr D Nuttall			✓	
Professor S J O'Brien[9]		✓		
Co-opted Members				
Dr D Brown	Health Protection Agency	✓		

[7] Chair of the *Ad Hoc* Group on Raw, Rare and Low Temperature Cooked Foods
[8] Chair of Antimicrobial Resistance Working Group
[9] Chair of *Ad Hoc* Group on Foodborne Viral Infections

		Ad Hoc Group on Foodborne Viral Infections	*Ad Hoc* Group on Raw, Rare and Low Temperature Cooked Foods	Antimicrobial Resistance Working Group
Dr N Cook	Food and Environment Research Agency	✓		
Dr D Lees	Centre for Environment, Fisheries & Aquaculture Science	✓		
Prof S Forsythe				✓
Mr C Teale				✓
Prof J Threlfall				✓
Departmental Representatives				
Mr S Wyllie	Department for Environment, Food and Rural Affairs	✓		✓
Ms S Wellsteed	Department of Health			✓
Administrative Secretariat				
Dr S Rollinson		✓		✓
Mr A Adeoye		✓	✓	✓
Miss S Butler		✓	✓	✓

		Ad Hoc Group on Foodborne Viral Infections	*Ad Hoc* Group on Raw, Rare and Low Temperature Cooked Foods	Antimicrobial Resistance Working Group
Scientific Secretariat			✓	
Dr P Cook				✓
Dr D Cutts		✓		
Dr I Hill			✓	
Ms K Thomas				✓

Annex IV

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

Member	*Personal interests*		*Non-personal interests*	
	Name of company	**Nature of interest**	**Name of company**	**Nature of interest**
Professor S J O'Brien	None		Various	Research funding in collaboration with industrial partners FSA funded research
Dr G Adak	None		None	
Dr G Barker	None	Research Funding in collaboration with industrial partners	None	
Mr J Bassett	John Bassett Consulting Ltd	Principal Consultant	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

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

Member	*Personal interests*		*Non-personal interests*	
	Name of company	**Nature of interest**	**Name of company**	**Nature of interest**
Professor D McDowell	University of Ulster 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	None	
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	
Antimicrobial Resistance Working Group				
Dr S Forsythe				
Mr C Teale				
Prof J Threlfall				

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 e.g.

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

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

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

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

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

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

DEFINITIONS

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

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

- Trade associations representing companies involved with such products;

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

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

Annex VI

GOOD PRACTICE GUIDELINES FOR THE INDEPENDENT SCIENTIFIC ADVISORY COMMITTTEES

PREAMBLE

Guidelines 2000: Scientific Advice and Policy Making[10] 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*[11] (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*[12] 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.

[10] Guidelines on Scientific Analysis in Policy Making, OST, October 2005. Guidelines 2000: Scientific advice and policy-making. OST July 2000
[11] Code of Practice for Scientific Advisory Committees, OST December 2001
[12] 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[13]
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[14]
Committee on Mutagenicity of Chemicals in Food, Consumer Products and the Environment[15]
Committee on Toxicity of Chemicals in Food, Consumer Products and the Environment[16]
Scientific Advisory Committee on Nutrition[17]
Spongiform Encephalopathy Advisory Committee[18]

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

[13] FSA Secretariat
[14] Joint FSA/HPA Secretariat, HPA lead
[15] Joint FSA/HPA Secretariat, HPA lead
[16] Joint FSA/HPA, FSA lead
[17] Joint FSA/DH Secretariat
[18] 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[19].

10. Formal statistical analyses will be included wherever possible. To support this, each committee will have access to advice on quantitative analysis and modelling as needed.

11. When considering what evidence needs to be collected for assessment, the following points will be considered:
    - the potential for the need for different data for different parts of the UK or the relevance to the UK situation for any data originating outside the UK; and
    - whether stakeholders can provide unpublished data.

12. The list of references will make it clear which references have either not been subject to peer review or where evaluation by the committee itself has conducted the peer review.

Uncertainty

13. When reporting outcomes, committees will make explicit the level and type of uncertainty (both limitations on the quality of the available data and lack of knowledge) associated with their advice.

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

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

15. Data gaps will be identified and their impact on uncertainty assessed by the committee.

16. An indication will be given by the committee about whether the database is changing or static.

Drawing conclusions

17. The committee will be broad-minded, acknowledging where conflicting views exist and considering whether alternative hypotheses fit the same evidence.

18. Where both risks and benefits have been considered, the committee will address each with the same rigour.

19. Committee decisions will include an explanation of where differences of opinion have arisen during discussions, specifically where there are unresolved issues and why conclusions have been reached.

20. The committee's interpretation of results, recommended actions or advice will be consistent with the quantitative and/or qualitative evidence and the degree of uncertainty associated with it.

21. Committees will make recommendations about general issues that may have relevance for other committees.

Communicating committees' conclusions

22. Conclusions will be expressed by the committee in clear, simple terms and use the minimum caveats consistent with accuracy.

23. It will be made clear by the committee where assessments have been based on the work of other bodies and where the committee has started afresh, and there will be a clear statement of how the current conclusions compare with previous assessments.

24. The conclusions will be supported by a statement about their robustness and the extent to which judgement has had to be used.

25. As standard practice, the committee secretariat will publish a full set of references (including the data used as the basis for risk assessment and other committee opinions) at as early a stage as possible to support openness and transparency of decision-making. Where this is not possible, reasons will be clearly set out, explained and a commitment made to future publication wherever possible.

26. The amount of material withheld by the committee or FSA as being confidential will be kept to a minimum. Where it is not possible to release material, the reasons will be clearly set out, explained and a commitment made to future publication wherever possible.

27. Where proposals or papers being considered by the Board rest on scientific evidence, the Chair of the relevant scientific advisory committee (or a nominated expert member) will be invited to the table at Open Board meetings to provide this assurance and to answer Members' questions on the science. To maintain appropriate separation of risk assessment and risk management processes, the role of the Chairs will be limited to providing an independent view on how their committee's advice has been reflected in the relevant policy proposals. The Chairs may also, where appropriate, be invited to provide factual briefing to Board members about particular issues within their committees' remits, in advance of discussion at open Board meetings.

Glossary of Terms

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.

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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