Advisory Committee on the Microbiological Safety of Food

Annual Report 2011

Advises the Food Standards Agency on the Microbiological Safety of Food

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Contents

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

The Committee's terms of reference are:-

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

The various issues addressed by the Committee since its inception are detailed in this and previous Annual Reports[1-19] and in a series of subject-specific reports.[20-35]

Foreword

1. I am pleased to present the 2011 Annual Report of the Advisory Committee on the Microbiological Safety of Food (ACMSF). Over the past year, the Committee has provided advice to the Food Standards Agency (FSA) on a range of issues relating to the microbiological safety of food.

2. In January 2011 the FSA sought our views on the health risks to consumers associated with unpasteurised milk and cream for direct human consumption. Following consideration the Committee concluded that given the evidence presented it could not justify a need to change its recommendation that pasteurisation is an important control measure in reducing the risks from consumption of raw milk. It was added that further data gathering may help give a more precise estimate of risk.

3. Twice in 2011 we considered the risks to consumers associated with *Mycobacterium bovis* and unpasteurised milk and milk products as we were unable to reach a robust conclusion based on the data presented at one meeting. With the involvement of a small group of Members additional data was considered and presented in a revised paper using a formal semi-quantitative risk assessment framework. The Committee welcomed the risk assessment framework used and agreed with the conclusion that the risk to human health from *M. bovis* in unpasteurised cows' milk and milk products is very low.

4. In September the *Ad Hoc* Group on Vulnerable Group's draft final report on the risks posed by *Toxoplasma* in the food chain was presented. This report was issued in response to the FSA's request to the ACMSF for advice on various issues concerning toxoplasmosis and food. Subject to a few amendments the Committee supported the recommendations made in the report and agreed it should be published for public consultation.

5. The Committee was briefed on several pieces of research of relevance including the findings of the second Infectious Intestinal Disease Study (IID2), research undertaken as part of the Rural Economy and Land use programme (RELU) and the outcome of the FSA's Food and You Survey. The Committee was provided with updates on key discussions from the Epidemiology of Foodborne Infections Group meetings. The Committee was also provided with details of the epidemiological and microbiological investigations carried out in response to the Verotoxigenic *Escherichia coli* (VTEC) outbreaks in Germany and France.

6. The Committee was requested to review the microbiological food safety aspects of the Waste and Resources Action Programme's (WRAP) draft report on the 'Quality, safety and use of digestate in UK agriculture'. This was taken forwards through a small group of Members who reviewed the detailed report in depth and provided comments.

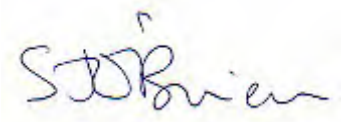
7. The Committee continued to have a number of active sub-groups in 2011. The *Ad Hoc* Group on Vulnerable Groups completed their draft risk profile on toxoplasma in the food chain and the *Ad Hoc* Group on Foodborne Viral Infections continued to gather evidence to inform their consideration of the risks from foodborne viruses.

8. An independent quinquennial review of the ACMSF was conducted between January and March 2011. The review concluded there was still a need for the ACMSF with value to the FSA, other Government Departments and stakeholders. We noted and responded to the recommendations of the review and are working to implement these.

9. On openness, further to the Committee's December 2009 recommendation that the Secretariat consider the practicalities of a move to more openness for ACMSF subgroup meetings, we endorsed the Secretariat's proposal for meetings of Working and *Ad Hoc* groups to continue to be held in reserved business. However, it was agreed that a written summary of these meetings should be presented at the following main Committee meeting and published on the ACMSF website.

10. Looking to the future, under the Committee's horizon scanning activities, we will consider changing food preparation techniques in the hospitality sector that may impact on microbiological food safety. We will look at potential approaches to conducting risk assessments and will publish the outcome of the public consultation on the risks posed by *Toxoplasma* in the food chain. In addition we will continue to consider the risks posed by *Campylobacter, Escherichia coli, Listeria, Salmonella* and viruses in food.

11. I should like to thank Prof Tom Humphrey, Mr Alec Kyriakides, Prof Paul Hunter and Prof David Brown who retired from the Committee after serving the maximum 10 years as allowed by the Public appointments rules. I am indebted to the 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 who 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 twentieth Annual Report of the Advisory Committee on the Microbiological Safety of Food and covers the calendar year 2011.

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[36], the guidance issued by the Office of the Commissioner for Public Appointments (OCPA)[37] and the Government Office for Science Code of Practice for Scientific Advisory Committees[38]. The FSA is not bound to follow OCPA guidance, as ACMSF appointments do not come within the remit of the Commissioner for Appointments and the guidance applies only to appointments made by Ministers. However, although ACMSF appointments are not made by Ministers, the Agency has decided that it would nevertheless be right to comply with OCPA guidance as best practice.

Periods of appointment

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

Spread of expertise

4. A wide spectrum of skills and expertise is available to the ACMSF through its Members. They are currently drawn from commercial catering, environmental health, food microbiology, food processing, food research, food retailing, human epidemiology, medical microbiology, public health medicine, veterinary medicine, and virology. The Committee also has one consumer Member.

5. Members are appointed on an individual basis, for their personal expertise and experience, not to represent a particular interest group.

Appointments in 2011

6. Four Members were appointed to the ACMSF[39] during 2011: Dr Roy Betts (provides the Committee with expertise on food microbiology), Ms Jenny Hopwood (provides the Committee with food retail expertise), Dr Goutam Adak (provides the Committee with epidemiology and public health expertise) and Professor Jim Gray (provides the Committee with virology expertise). Their period of appointment runs from 1 April 2011 to 31 March 2015.

Re-appointments in 2011

7. The period of appointment for Mrs Rosie Glazebrook who is the Committee's consumer representative expired on 31 March 2011. Mrs Glazebrook was re-appointed for a further 3 years from 1 April 2011 until 31 March 2014.

Committee and Sub-Group meetings

8. The full Committee met 3 times in 2011 - on 20 January, 27 June and 22 September. The three meetings were chaired by Professor Sarah O'Brien and were open to members of the public.

9. The *Ad Hoc* Group on Vulnerable Groups (Chair: Professor Tom Humphrey until February 2011, Dr Rick Holliman from February 2011) met twice, in February and April 2011. The Group presented its draft final report; a risk profile in relation to toxoplasma in the food chain, to the Committee in September 2011 and this was agreed to be issued for public consultation.

10. The *Ad Hoc* Group on Foodborne Viral Infections (Chair: Professor David Brown until March 2011, Professor Sarah O'Brien from March 2011) met five times in 2011.

Current membership and Declarations of Interests

11. Full details of the membership of the Committee and its Working and *Ad Hoc* Groups are given in Annex III. A Register of Members' Interests is at Annex IV. In addition to the interests notified to the Secretariat and recorded at Annex IV, Members are required to declare any direct commercial interest in matters under discussion at each meeting, in accordance with the ACMSF's Code of Practice[41]. Declarations made are recorded in the minutes of each meeting.

Personal liability

12. In 1999, the Secretary of State for Health undertook to indemnify ACMSF Members against all liability in respect of any action or claim brought against them individually or collectively by reason of the performance of their duties as Members (Annual Report 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

13. The ACMSF is committed to opening its work to greater public scrutiny. The agendas, minutes and papers (subject to rare exceptions on grounds of commercial or other sensitivity) for the full Committee's meetings are publicly available and are posted on the ACMSF website. Also in January 2011, the Committee agreed to publish on its website a written summary of meetings of Working and Ad Hoc groups. ACMSF's website can be found at:

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

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

acmsf@foodstandards.gsi.gov.uk

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

Open meetings

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

17. All of the 2011 Committee meetings were held in Aviation House, the FSA's London Headquarters.

18. All of these open meetings follow a common format. Time is set aside following the day's business for members of the public and others present to make statements and to ask questions about the ACMSF's work. The names of participants, the organisations they represent, and details of any statements made, questions asked and the Committee's response, are recorded in the minutes of the meeting.

Work of the other advisory committees and cross-membership

19. The Secretariat provided Members with regular reports of the work of other Scientific Advisory Committees advising the FSA in 2011. Mrs Rosie Glazebrook ACMSF consumer representative is a member of the Advisory Committees on Carcinogenicity (COC) and Mutagenicity (COM). 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 2011

Mycobacterium bovis and the possible health risks associated with unpasteurised milk and milk products

20. At its June 2011 meeting, the FSA sought the Committee's views on risks to consumers associated with *M. bovis* and unpasteurised milk and milk products[42.] This was the final part of the Committee's considerations on the health risks associated with the increased incidence of *M. bovis* in cattle in the UK. Members were reminded that the possible health risks associated with *M. bovis* and consumption of meat and of pasteurised milk and milk products had been discussed by the Committee in January and September 2010 respectively. The Committee was informed of the intention to report the outcome of their assessments to the FSA Board, which had requested the review.

21. The paper presented included information on exposure assessment, the TB controls on cattle (cows and buffaloes) and on non-bovines (sheep and goats), the controls on sales of unpasteurised milk and milk products to the consumer and the potential for *M. bovis* to be present in unpasteurised milk and milk products for human consumption. The Committee was asked to give a view on the potential for unpasteurised milk and milk products contaminated with *M. bovis* to enter the food chain and the risk to human health associated with these products, also whether this risk has changed in light of the increase in *M. bovis* in cattle in the UK.

22. The Committee also received a presentation from Dr Michael Rowe and Dr Richard Forgrave (Queen's University Belfast) on their research on the survival of *M. bovis* in unpasteurised milk cheeses. The research was commissioned to assist in assessing the risk from raw milk cheeses made prior to identification of a TB reactor in a herd i.e. cheeses maturing but not yet on the market. The presentation outlined the research objective (to assess the survival kinetics of *M. bovis* in raw milk Cheddar and Caerphilly), the steps taken in designing a protocol for production of experimentally contaminated cheese in a Category 3 facility, selection of media suitable for enumeration of *M. bovis* and the results of challenge test experiments performed using the optimised protocol. Overall average D_{10} values were calculated for *M. bovis* in Cheddar (48 days) and in Caerphilly (58 days).

23. In relation to the research presented the Committee had a number of questions and comments:

    - Members queried the mechanism for the observed reduction of *M. bovis* in cheese and whether it was due to pH, salt, moisture,

competition with other organisms, etc. The possibility of eventually developing predictive models for cheese products using the methods developed in this study was raised. Dr Rowe commented that reduction in bacterial numbers was probably due to a combination of all the suggested factors and also highlighted that the calculated D_{10} values for *M. bovis* were approximately half of the D_{10} value for *M. avium* subspecies *paratuberculosis* (MAP).

- Dr Forgrave confirmed that the pre-warmed milk sample was not used in the production of the cheeses and Dr Rowe confirmed that the volumes of milk used in experimental production were restricted due to the need to use Category 3 facilities and therefore were not representative of typical volumes used in cheese production.

- Members noted that the minimum maturation period was the key consideration in assessing the risk from a product and it was confirmed that Caerphilly may have a minimum maturation of 2 weeks.

- Members suggested that it would be interesting to look at *M. bovis* survival in Cheddar for longer maturation periods to see whether there was any tailing-off effect.

- Dr Forgrave confirmed that the D_{10} values were calculated from the straight portion of the challenge test graph but that Cheddar samples were still available for further experimentation if desired.

24. Members considered the risk assessment on *M. bovis* and the questions posed in the FSA's paper. In the ensuing discussion the following points were made:

- Members felt it was difficult to come to a robust conclusion based on the data presented in the risk assessment. The increased incidence of *M. bovis* in cattle meant there was potentially an increased risk to consumers but it was not easy to quantify this increased risk as there was insufficient information available.

- Members suggested that a more detailed paper with further more precise data and references would assist the Committee in assessing the risk. In particular the paper[42] (ACM/1021) could include more complete references to the data presented (in paragraphs 21, 22, 24 and 41), give an indication of the prevalence of *M. bovis* and TB mastitis in cattle (Defra noted there was a wealth of data on the prevalence of bovine TB) and clarification of terms like small, high, low should be given. There were also concerns that some of the conclusions were validated with inadequate surveillance data, for example for non-bovine species.

- It was suggested that the data available should be mapped out at each step of the risk assessment, i.e. under the sections on exposure, prevalence, shedding etc., rather than starting with outlining risk management activities. This would allow a conclusion to be drawn on probability rather than possibility. In cases where no published data were available expert opinion could be sought.

- Questions were raised around the quoted efficacy of the BCG vaccine in humans and on what data this was based. A member confirmed there had been a significant amount of research on efficacy of the BCG vaccine which showed it varied from 0-80%, but suggested this information was not relevant to the risk assessment. It was also suggested that the risk assessment should make reference to the gap in the population that will be unvaccinated due to the recent change in vaccination strategy. It was also suggested that if health warnings were in place that vaccination was of variable efficacy and there were potential long term health effects related to *M. bovis* is raw milk there may be less of a market for unpasteurised milk/milk products.

- A Member queried the information presented on the infectious dose of *M. bovis* and suggested that if, in some cases, a low dose could cause infection in some individuals this would affect the assessment of risk. It was confirmed that information on the infectious dose for *M. bovis* was sourced from the HPA TB Reference Unit and references could be provided if required.

- In relation to the published evidence on survival of *M. bovis* in cheeses it was confirmed that there is little available evidence on this but what is available suggests survival is possible in short shelf-life products.

25. The Committee acknowledged that it was difficult to draw a robust conclusion on the risks to consumers associated with *M. bovis* and unpasteurised milk and milk products, recognising the difficulties in finding robust data to support a risk assessment. The risk of human TB infection being acquired from unpasteurised milk and milk products had probably changed with the increase in *M. bovis* in cattle but uncertainties around the change in the level of risk were large and difficult to define. There were no data presented in the paper that warranted a change to the previous view of the Committee on unpasteurised milk which was that all milk should be pasteurised. In response to the Secretariat's question on whether the Committee would like to revisit the risk assessment if further detail was added to the FSA's paper, the Committee agreed to set up a small group (Mr John Bassett, Prof David McDowell and Prof Sarah O'Brien) to look at the data in more depth.

26. The nominated group of ACMSF Members met by teleconference twice to consider additional data provided by the FSA and suggested a more formal risk assessment framework was used to present the data in a revised paper.

27. The revised paper on *M. bovis* and unpasteurised milk and milk products was presented to the Committee at their September meeting. The paper was structured as a formal semi-quantitative risk assessment with information presented under sections on hazard identification, hazard characterisation, exposure assessment and risk characterisation[43]. The assessment attempted to estimate the likely number of *M. bovis* organisms ingested in a consumption event if contamination were present in unpasteurised milk or milk products. The data and calculations in each section of the document were outlined including key uncertainties and assumptions associated with each stage of the risk assessment. Members were asked to consider and agree to the conclusion of the risk assessment that;

    - the risk of human TB infection being acquired from unpasteurised milk and milk products has changed with the increase in *M. bovis* in cattle,

    - the risk to human health from *M. bovis* in unpasteurised cows' milk and milk products is very low,

    - the risk to human health from *M. bovis* in unpasteurised sheep, goat and buffalo milk and milk products is likely to be very low however, due to a lack of data on these species there are more uncertainties associated with this assessment.

28. In the ensuing discussion Members agreed that the presentation of the document was helpful in assimilating the data and evaluating the conclusions presented and was a more useful way of looking at the data in a consistent manner. Members supported the conclusions made in the risk assessment. It was noted that in some cases there was difficulty in the use of terms like 'low' as this was a qualitative judgement dependent on consumers' interpretation. In paragraph 53 of ACM/1047 it was noted that the second bullet should be amended to read 'severe mastitis is likely to involve a reduction in milk production'. In relation to the unknown infectious dose for immunocompromised individuals it was suggested that this was probably, at most, the same as for the general population and likely to be considerably less.

29. The Committee supported the conclusions of the risk assessment and found the format of the revised document much clearer. In some instances in the absence of quantitative data use of terms such as 'low' and 'very low' were all that could be supported, based on a qualitative

judgement of the data. Following the minor amendments suggested by the Committee it was agreed the risk assessment conclusions should go forward for consideration by the FSA Board. As the Committee welcomed the framework used for the risk assessment, ACMSF Chair indicated that the Committee would be revisiting risk assessment formats at a later date.

Raw Milk

30. In January, the FSA sought the Committee's views on the health risks to consumers associated with unpasteurised milk and cream for direct human consumption[44]. Members were informed that the FSA Board had raised concerns over the proportion of raw cows' milk samples failing microbiological testing criteria in a recent FSA Operations report and requested the FSA review current evidence on the safety of raw milk for direct human consumption. Information on human illness, microbiological quality, market data and current legislation in relation to raw milk and cream was provided in the paper. It was noted that on previous occasions when the ACMSF has considered data on the safety of raw drinking milk the Committee has stressed the importance of pasteurisation in the protection of human health.

31. Data from the Health Protection Agency on outbreaks of Infectious Intestinal Disease (IID) due to raw milk and cream were summarised. Outbreaks of human illness due to raw drinking milk between 1992 and 2002 represented a small proportion of the total number of reported foodborne outbreaks during this period. No outbreaks of IID due to raw milk or cream had been reported in the last eight years suggesting the burden of disease from these sources had declined, although under-reporting of outbreaks and likely sporadic cases of illness were acknowledged.

32. Microbiological surveys carried out over the last 15 years on raw milk and cream from cows and other species showed that pathogenic microorganisms were present in some raw milk samples and indicators of faecal contamination were present at varying levels in most samples. Data from the statutory quarterly monitoring of raw cows' milk for compliance with microbiological criteria were also summarised, as this provides a useful indication of the quality of raw cows' drinking milk. The level of sample failures had remained fairly constant over the last 7 years, as the number of samples tested had declined probably due to a decline in production. It was noted that the total number of failures included re-samples from farms which failed the criteria and, therefore, a small number of farms consistently failing can skew the failure rate.

33. Areas where data were lacking included information on sales volumes, which made it difficult to assess the level of human exposure, recent surveillance data on the frequency of pathogenic contamination of raw milk and cream and microbiological quality data from species other than cows. The Committee was requested to consider if the data presented were sufficient to assess the current risks to human health and, if so, to review its previous assessment of the risks to consumers from consumption of raw drinking milk and to consider raw cream.

34. In the ensuing discussion the Committee noted that:

- Much of the data presented were old and due to data gaps in many areas a robust and specific risk assessment was difficult. The epidemiology has probably changed in terms of overall consumer exposure through consumption of raw drinking milk. The risk to the individual was likely to have remained the same and was considered non-negligible, as before, but it was not possible to quantify this based on available data.

- No new data were presented which would justify a change from the Committee's current position and there was no new evidence to suggest raw milk and cream were safer than previously.

- The lack of recent reported outbreaks of human illness linked to raw milk could possibly be as a result of reduced exposure to raw milk and cream. New sales routes, such as internet sales and farmers markets, could make identification of outbreaks less likely as raw milk and cream consumers would be more widespread.

- The presence of faecal contamination in raw milk was apparent from the current data presented on the microbiological quality of raw milk and the link between faecal contaminants and the presence of pathogens has been demonstrated.

- More information on consumption levels and in particular on new sales routes such as internet sales would assist in assessing whether the level of risk had changed. Data from the HPA's enhanced surveillance for *E. coli* O157 infections might also provide some relevant information. However, it was also noted that further data are only needed if a more precise estimate of risk is required.

35. The Committee concluded that given the evidence presented it could not justify changing its recommendation that pasteurisation is an important control measure in reducing the risks from consumption of raw milk. However, further data gathering may help give a more accurate assessment of risk if desired. ACMSF indicated that if data on

changing sales routes is gathered there may be a need for the Committee to review the risks from raw drinking milk.

Germany and France *E. coli* outbreaks

36. In June, the FSA briefed the Committee on the *E.coli* outbreaks in Germany and France. It was highlighted that as the outbreaks were on-going the figures presented at the meeting could change. Members were informed that the German outbreak was the most serious foodborne disease outbreak identified to date in the EU. Many agencies and organisations have been involved in the investigations both in Germany and across the EU, including EFSA, the European Centre for Disease Prevention and Control (ECDC) and the Commission and several documents have been published describing preliminary outbreak findings, including sequencing information on the outbreak strain. The Commission have indicated the Shiga-toxin producing *E.coli* O104 outbreak strain should be referred to as STEC (the nomenclature used in US and Germany) rather than VTEC in relation to the German outbreak. An update on the number of cases of *E. coli* infection and Haemolytic Uremic Syndrome (HUS) cases was given and the onset dates of the outbreak, geographical location and typing data results were briefly described. The FSA outlined the epidemiological and microbiological investigations to date and the implication of sprouted seeds as a possible source from the most recent trace-back and trace-forward investigations.

37. The Committee was provided with a brief update on the *E. coli* outbreak in France, linked to sprouted seeds produced for a school community event. Initial typing information from some of the cases indicated the same O104 strain may be involved. Samples of the implicated seeds had been submitted for testing and the FSA had issued a web story with advice for consumers to thoroughly cook sprouted seeds. An EFSA task-force had been set up to co-ordinate investigations and try and identify any common links between the two outbreaks.

38. Dr Bob Adak (HPA and ACMSF member) provided some additional information on the outbreaks. Members were informed that the outbreak strain was genetically different to previous VTEC strains, possessing a unique combination of virulence factors that has not been seen in an EU foodborne outbreak before. It also has a different disease profile from classic VTEC infections with a higher number of associated HUS cases and a longer incubation period. All *E. coli* O104 cases outside Germany could be linked back to travel to Germany or consumption of German sprouted seeds. Dr Adak noted that the Germans had done a lot of in-depth investigation to try and identify the source of infection and provided some further detail on the investigations into both the German and French

outbreaks. It was noted that sprouted seeds had caused large outbreaks of foodborne illness in the past.

Chicken liver pâtés

39. Following the Committee's previous consideration of the recent increase in *Campylobacter* outbreaks associated with chicken liver pâtés and parfaits Prof Tom Humphrey was invited to present a paper on *Campylobacter* and chicken liver[45]. Prof Humphrey noted that *Campylobacter* was traditionally recognised as a cross-contamination risk but the risk from *Campylobacter* in muscle tissue and livers should be considered equally important. Data on the presence of *Campylobacter* in muscle tissue and liver were presented including research from New Zealand where 27 out of 30 chicken livers examined were contaminated internally with *Campylobacter*, some with greater than 1100cfu/100g. The same study looked at the effect of time and temperature on survival of *Campylobacter* in the livers and showed no meaningful reduction in numbers of bacteria until approaching 70°C. It was suggested that flash fried livers were unlikely to reach this temperature internally.

40. Data on the effect of hot water treatment on *Campylobacter* numbers on chicken carcasses were also presented. Immersion in hot water did not result in any meaningful reduction in numbers, and it was suggested hot water treatments may only remove organisms which are not well attached. It was also highlighted that chilling *Campylobacter* leads to a small but significant increase in its resistance to heat.

41. Chicken livers may become contaminated with *Campylobacter* during the slaughter process but it was also suggested livers may become contaminated during the lifetime of the bird as it is known that some strains of *Campylobacter* are invasive and cause a vibrionic hepatitis in birds. The association between *Campylobacter* infection and bird welfare was discussed, including data that showed extra-intestinal spread of *Campylobacter* in immunosuppressed broilers and those co-infected with Avian Pathogenic *E. coli*. Prof Humphrey concluded there was a need to understand risk factors better, particularly the production environment, and mechanisms for the extra-intestinal spread of *Campylobacter* and to properly examine the resistance of *Campylobacter* to heat and other stresses.

42. The Committee asked a number of questions following the presentation. In response to queries on the effects of freezing on *Campylobacter* and the implications of the research presented on the current cooking recommendations Prof Humphrey confirmed that freezing kills most of the *Campylobacter* present in a sample and evidence suggests it was still the case that cooking at 70°C for 2 minutes will destroy any *Campylobacter*

present. The ACMSF Scientific Secretary (Dr Paul Cook) also confirmed that current FSA advice was that a core temperature (as opposed to an external temperature) of 70°C for 2 minutes (or an equivalent time/temperature) should be reached when cooking. Prof Humphrey confirmed that, in the slaughterhouse study, *C. jejuni* rather than *C. coli* was isolated from contaminated livers suggesting *C. coli* was better confined to the chicken gut than *C. jejuni*.

43. Further discussion suggested that there may be some confusion amongst consumers in how to prepare different cuts of meat and offals from different species and the appropriate cooking recommendations to follow. It was suggested that chicken liver should be considered in the same way as a comminuted product.

44. The discussion was concluded with the Committee noting that there was a need to understand more about *Campylobacter* and chicken liver contamination. It was highlighted that cooking liver to a core temperature of 70°C for 2 minutes should kill the *Campylobacter* present but there may be a need to consider liver as comminuted meat rather than a whole meat in the context of delivering appropriate food safety messages.

The Second Infectious Intestinal Disease Study

45. In September, the Committee was briefed by Prof Sarah O'Brien (Project Lead Contractor) and Dr C Tam (London School of Hygiene and Tropical Medicine) on the findings of the second Infectious Intestinal Disease Study (IID2)[46]. Prof O'Brien explained that the main driver for the study was to establish whether the incidence of IID in the community had changed since the mid 1990's (when IID1 was undertaken) and to help establish a baseline against which to measure any reduction in foodborne disease. Two methods were employed in the study to describe IID in the community; a retrospective telephone survey of self-reported illness and a prospective cohort study. A selection of molecular, immunoassay and culture-based methods were also used to detect the presence of micro-organisms in samples submitted.

46. Dr Tam presented the rates of IID calculated in the study based on the telephone survey and the cohort study. It was calculated that for every case of IID reported to national surveillance there were about 10 GP presentations and 147 community cases. Overall there were an estimated 17 million cases of IID per year in the UK. The rate of overall IID in the community in England had increased from IID1 to IID2 by about 50% but the rate presenting to primary care had halved, suggesting the way in which people use GP services has changed over the time between the two studies. The reporting patterns for specific pathogens were presented

and it was highlighted that the incidence of *Campylobacter* and norovirus had increased since IID1 (to 500,000 and 3 million respectively) but cases of *Salmonella* infection had decreased dramatically. Norovirus was the most commonly recognised cause of IID. It was estimated that 18.8 million school/working days were lost due to IID in the UK per year. The study limitations and strengths were briefly highlighted as was further work to determine the food-related component of IID.

47. ACMSF thanked Prof O'Brien and Dr Tam for their comprehensive presentation of the study and raised the following points:

- The study showed that IID rates in the community had increased since the mid-90s but that presentation to GPs with IID had decreased. The possible reasons for this observation were discussed. It was suggested that fewer people are presenting to their GPs but of those who do more samples are being taken, also patients with diarrhoea and vomiting are asked not to attend GP surgeries in winter to prevent spread of disease. Information was not sought from study participants on the process of getting an appointment and it was hypothesised that delays in getting an appointment may change presentation patterns, as with shorter-term illnesses patients may recover before they can get an appointment. The study did try and mitigate for this possibility as the molecular methods used had the ability to detect pathogens in older samples. It was noted that previous studies have shown that severity and length of illness (i.e. over 5 days) are the factors that drive people to seek GP consultation.

- The number of people in the telephone survey calling on behalf of children was queried. Dr Tam explained there was a limited amount of information that could be extracted from the phone data but they recognised a large number of the calls represented the 0-5 years age group.

- There was some discussion on comparison of molecular versus conventional diagnostics within the study and it was noted that *Salmonella* case numbers were higher if results from molecular methods were incorporated.

- There was a suggestion that direct linkage with medical records may have been helpful in calculating reporting ratios from the community to national surveillance. Prof O'Brien noted that it was a pragmatic decision to use an indirect method in the study to calculate the rates of IID presenting as it would have been very

difficult to contact every Health Protection Unit (HPU) to obtain relevant data.

- Information on non-respondents in the cohort study was requested. It was noted that only limited data could be collected on the non-respondents so formal comparisons were difficult. Looking at the composition of those that did participate there were more female respondents, fewer young adults and more respondents in a rural setting and with a managerial role.

- The presenters were asked to comment on the implications of the study on the Agency's foodborne disease strategy. Prof O'Brien noted that although research to assess the foodborne component had not yet been completed, it was possible to say that of the two most significant IID pathogens the majority of *Campylobacter* was likely to be foodborne and therefore the FSAs focus on this was appropriate. However, in terms of norovirus it was more difficult to say what proportion was foodborne, estimates in the literature varied from 11-40% which still suggested action to tackle foodborne norovirus was required.

48. The Committee concluded by reiterating its comments on how changes in access to GPs may affect comparative surveillance, on further investigations for those phoning on behalf of illness in others and on the consistency and comparability of pathogen detection methods. Members also suggested that a breakdown of age distribution by pathogen, rather than by totality of disease may be useful. The Committee noted that more focus was needed on the proportion of food related IID and the impact this may have.

Risk profile in relation to Toxoplasma in the food chain

49. In September Dr Rick Holliman, Chair of the *Ad Hoc* Group on Vulnerable Groups, presented the group's draft final report to the Committee on its work to examine the risks posed by *Toxoplasma* in the food chain[47]. This report was issued in response to the FSA request to the ACMSF for advice on various issues concerning toxoplasmosis and food. Dr Holliman thanked the co-opted members of the group (Dr Ed Guy: Public Health Wales and Mr Paul Hutchinson: Animal Health and Veterinary Laboratories Agency), Miss Jodie Crabb (Defra) and Dr Judith Hilton (former Head of Microbiological Safety Division of the FSA) for their contributions to the report. The contents of the report chapters were outlined. These covered the stages of human infection and parasite lifecycle, clinical disease, prevalence and burden of human disease, sources of infection (focussing on food animals), survival of *Toxoplasma* in foodstuffs and evidence on the importance of foodborne infection

versus environmental infection (one of the key considerations of the report). Consumer advice on toxoplasmosis given in the UK and in different countries was also outlined in the report. The main data gaps, conclusions and recommendations of the report were brought together in the final chapter.

50. Dr Holliman noted that a small proportion of people acquire toxoplasmosis but these suffer the greatest ill health. One of the report recommendations was therefore for further work to look at the burden of disease and the prevalence of toxoplasmosis, possibly through a seroprevalence study to provide information on the effectiveness of current controls and allow for more robust risk management strategies. A case-control study was also recommended to provide further information on how much infection may be due to contaminated food and how much due to other sources. It was also acknowledged that there were little data on the effect of food preparation processes on *Toxoplasma*. The report noted there was considerable variation in the toxoplasmosis related advice given by different countries. A recommendation was therefore made to review UK advice to pregnant women and update this in light of current information giving consideration to including other immuncompromised groups. Views and comments on the report were sought from the Committee.

51. The Committee made the following comments in discussion:

- The report makes no reference to human vaccination and there is little discussion on animal vaccination and whether this could reduce the burden of disease in animals. It was noted that there is no human toxoplasmosis vaccine available and vaccination against *Toxoplasma* in animals is primarily intended to protect animals from risks during the breeding season rather than decrease the *Toxoplasma* load in the foodchain. It was suggested that a vaccine which targets the intestinal lifecycle of the parasite (as with coccidial vaccines) could reduce levels of *Toxoplasma* in livestock and thereby the levels entering the food chain.

- The feasibility of a case control study on toxoplasmosis was questioned given the regional differences in seroprevalence and the variation in the relative importance of food sources estimated in different countries. It was noted there would be significant challenges associated with sample size and hypothesis generation for such a study. Dr Holliman accepted that there were difficulties with a case-control study but a robust measure of the foodborne component of toxoplasmosis was key in assessing the human health risks and accurately estimating the burden of disease which was probably under-recognised at present.

52. The Committee agreed that it would be useful to include a brief comment on the absence of a human vaccine and the use of animal vaccines in the report. The Committee also agreed that data in chapter 6 of the report on pregnancies in which transmission of toxoplasma occurs, should be presented in a tabular form and table 5 (that provides advice to consumers on toxoplasmosis from a number of countries) should be amended so a clearer comparison of advice given by different countries could be made. Subject to these amendments the Committee agreed the report should be published for public consultation.

Horizon Scanning

53. At the Committee's September 2010 meeting, Members considered a number of potential horizon scanning topics. After discussion on the identified topics Mr Alec Kyriakides, Professor David McDowell, Mr John Bassett and Mrs Vivianne Buller were asked to consider the topics identified in more detail and report back to the Committee. At the Committee's January 2011 meeting, Mr Kyriakides briefed Members on the group's discussion and prioritisation of horizon scanning topics[48]. To complement the Committee's discussions on horizon scanning a presentation on the FSA's ongoing work to identify emerging risks was also provided and both items were discussed together.

54. Mr Kyriakides reported that the group initially considered the merits of an organism specific approach versus a broader approach to identification of horizon scanning topics. They decided that a broader look at underlying technological factors that would affect microbiological risks in the future was most appropriate given that no significant changes that would merit an organism specific approach were identified. The 4 horizon scanning topics identified by the group, in priority order, were:

- changes in food preparation practices in the kitchen, catering and retail;
- agricultural changes focussing on the primary agricultural sector;
- globalisation of food sourcing and production;
- food processing and production changes at a manufacturing level.

55. The group considered that changes in emerging pathogens and demographics would be picked up by the Committee's Working Groups on Emerging Pathogens and Vulnerable Groups respectively. These areas were therefore not identified as separate horizon scanning topics. The Committee was recommended to consider one or more of the four topics in depth to identify specific emerging issues which might require further consideration.

56. Ms Pengilly introduced work the FSA was piloting which aims to make better use of existing intelligence to identify trends in food safety risks using a National Intelligence Model to collate and manage information from various sources. Trends in food safety incidents can be measured against a baseline of stable data from recorded incidents in previous years. Although microbiological incidents as a category were not identified as one of the fastest growing emerging risks there had been an increase in such incidents over the last 4 years which is predicted to continue in the

next few years. A spike in microbiological incidents in early 2010 due to norovirus contamination was highlighted. Analysis of Rapid Alert System for Food and Feed (RASFF) reports showed a number of more specific microbiological hazards where RASFFs had been increasingly raised including parasites in fish, *Listeria* in fish products and *Salmonella* in fruit and vegetables.

57. The Committee made a number of comments on the emerging risks presentation including the need to build in evaluation of the work to assess whether the pilot was working effectively. In response to a query on how intelligence from Members of the public was captured, Ms Pengilly explained that one of the intelligence sources included in the work was the Memex database where evidence on food fraud from a range of sources, including the public, was recorded and assessed.

58. The Committee supported the broader horizon scanning approach outlined in paper ACM/1007 and the four horizon scanning topic identified. However, it was noted that the topics raised were very broad and a way of focussing these down was required. It was noted there was no mention of regulatory changes and subsequent unintended consequences and it may also be useful to formally capture at what stage in the food chain specific horizon scanning issues arise.

59. The Committee endorsed the horizon scanning topics proposed and highlighted that in taking this work forward there may be need to draw on the expertise of other Advisory Committees. Members recommended that the horizon scanning group's paper be forwarded to the FSA.

Waste and Resources Action Programme: Quality, safety and use of digestate in UK agriculture

60. In September, the Committee was requested to review the microbiological food safety aspects of the Waste and Resources Action Programme's (WRAP) draft report on the 'Quality, safety and use of digestate in UK agriculture'[49]. Dr David Tompkins from WRAP gave a presentation on the report.

61. Dr Tompkins explained the main drivers for production of the report in terms of the reduction and re-use of food and drink wastes. The different types of digestate, the remit of WRAP and the scope of the report were also outlined. The report brings together seven discreet pieces of work commissioned through WRAP each presented in a separate chapter. The Committees views were primarily sought on the robustness of the anaerobic digestates risk assessment and the *Clostridium botulinum* review. The risk assessment was intended to deliver a matrix for digestate (Biofertiliser) use and give clear risk-based guidance to minimise food

safety risks. Views were also sought on whether the proposed matrix gave adequate safety for the ranges considered. Dr Tompkins highlighted that multiple feedback streams for the report were in place and it would be amended to take comments into account as it was important that both digestate producers and users had confidence in the report. The aim was to publish the report in full in 2012.

62. As a number of specific questions were outlined for consideration by the Committee in reviewing the report comments were requested from Members.

63. In discussion the Committee made the following comments on the report:

- Consideration should be given to the inclusion of non-O157 VTEC in the risk assessment.

- More consideration on the effect of anaerobic digestion on TSEs was needed.

- In terms of the proposed biofertiliser matrix, given the crucial role of pasteurisation, the use of pasteurised digestate only on Category 3 fresh produce should be considered if the produce would be eaten lightly cooked or uncooked.

- Many data gaps were highlighted in the report in relation to *C. botulinum* which had prevented any conclusions being drawn on the associated risks in digestates. The ACMSF had, in the past, considered botulism in cattle, where many data gaps also existed; they had, however been able to reach a reasonable assessment of risk. Recent research concerning growth of clostridia in culture media may provide a useful alternative to animal models and could be explored to address some of the data gaps. It was suggested that *C. botulinum* in poultry litter could potentially be used as a worst case scenario to help plug some of the data gaps.

- It was suggested that the persistence of organisms is the important factor to consider in assessing the risks from digestates, particularly in relation to *C. botulinum*. In many instances the report states that no significant growth of organisms was found and the tone of document therefore implies that, if there is no significant growth of organisms, the situation won't be getting any worse. However, there is no evidence to support this assumption.

- The Defra assessor (Mr Wyllie) noted that, in relation to scrapie, food chain production systems would reduce exposure as only low risk animal by-products are allowed into the system. Therefore there should

be a very low risk in the case of waste from the food chain with respect to scrapie.

- Dr Tompkins responded that, with respect to TSEs, it was difficult to assess the risks as there was little information on secondary exposure to TSEs. He also clarified that in relation to *C. botulinum* two further pieces of work were progressing; one to look at the impacts of un-pasteurised versus pasteurised digestates on a range of diseases including *C. botulinum* and another to gather field evidence on *C. botulinum* spore loadings in the environment. In relation to Category 3 fresh produce Dr Tompkins highlighted that the Red Tractor protocols were being re-issued and would not permit unpasteurised anaerobic digestates on Category 1, 2 or 3 produce.

64. Given the amount of information to consider in the report the Committee agreed that the group of Members that considered the previous WRAP report should be re-convened to give more detailed scrutiny to the anaerobic digestates report and provide a draft response for the Committee to approve.

Food and You Survey

65. In June Miss Robyn Ackerman (FSA Social Science Research Unit) briefed the Committee on the FSA's Food and You Survey [50]. The survey was commissioned to address a need to collect more robust data on consumer attitudes, behaviours and knowledge. The food safety aspects of the survey were highlighted including top-line findings on questions around chilling, cross-contamination, cleaning and cooking of food. Segmentation analysis to group survey respondents based on their attitudes and habits rather than socio-demographics had started to identify some discreet groups. Analysis to segment the responses from the over 60's was also ongoing. Further work is planned to attempt to measure actual, rather than reported, behaviours in the home and a second wave of the survey is planned for 2012 to track how practices change and attitudes develop over time.

66. Miss Ackerman noted that the survey report is available on foodbase (http://foodbase.org.uk/) and there was some publicity around the survey when it was published. Members were informed that the FSA was trying to encourage other researchers who may want to analyse the data which is deposited in the Essex data archives.

67. Members had a number of questions about the survey including whether it covered how people chose where to eat out, how non-response bias was controlled for, whether children were included in the survey and whether the results were relevant for investigating the increase in listeriosis in the

over 60s. Miss Ackerman clarified that one of the survey questions covered the factors that people take into consideration when deciding where to eat out. Respondents who said food hygiene was a consideration were followed up to ask how they assessed the hygiene standards at premises. In relation to non-response the survey response rate, which was 52%, was considered relatively good for surveys of this type. The sampling strategy allowed weighting to correct for non-response. Children were not included in the survey, which included over 16's only. In relation to listeriosis it was noted that the segmentation of data from the over 60's should help explore attitudes/behaviours that may increase the risk from listeriosis in this age-group. However, there were no baseline data on attitudes prior to the increase in listeriosis for comparison.

Rural Economy and Land Use Programme

68. In January, Prof Strachan and Prof Farrington (University of Aberdeen) and Prof Rigby (University of Manchester) briefed the Committee on the findings of their research under the Rural Economy and Land Use (RELU) programme [51].

69. Prof Strachan introduced the presentation and the research approach taken. The work aims to integrate the social and natural sciences to research reducing the *E. coli* O157 risk in rural communities focussing on two study areas, N. Wales and Grampian. Prof Strachan summarised the studies on *E. coli* O157 survival in soil, noting that organism numbers decreased rapidly during the first few days and no differences were found in survival in different soil types. Recovery studies showed organism reactivation was seen more strongly at lower temperatures. Measurement of *E. coli* O157 serum antibody levels in the study areas showed around 5% of farmers, abattoir workers and rural and urban residents tested were positive. A regression model and risk assessment were used to predict the mean number of *E. coli* O157 cases attributed annually to different transmission pathways in Grampian, these approaches attributed 27% and 56% of cases to food respectively.

70. Prof Farrington presented the public awareness work undertaken using a questionnaire survey of 2,000 farmers, residents, visitors and abattoir workers in the study regions. The results demonstrated a wide awareness of *E. coli* O157, particularly in high disease incidence areas, although there was a generally low awareness of bloody diarrhoea as a symptom. Strong opinions around belly clipping recommendations were highlighted in several questionnaire responses from farmers.

71. Prof Rigby presented the findings of a consultation with farmers and the public to investigate the perceived risk from *E. coli*. *E. coli* was found to be a relatively high worry risk as articulated by people, higher than other food related worries such as GM, BSE and bird flu. Work was also undertaken to assess the practicality and effectiveness of measures to control *E. coli* O157 as ranked by experts and farmers. Some interventions such as vaccination were ranked as potentially highly effective by experts but not by farmers and others, such as pre-slaughter removal of high shedders, were considered more practical by farmers than experts. However, no single ideal intervention was identified by this expert elicitation.

72. The Committee had a number of questions for the presenters:

- The Defra assessor (Mr Stephen Wylie) asked whether any interventions generally considered effective were ranked with a low efficacy and practicality by experts. Prof Rigby responded that there is evidence from systematic trials for the effectiveness of dry bedding and double fencing as *E. coli* O157 control measures but these were both given a low score by experts.

- In response to questions on the soil survival experiments Prof Strachan clarified that 8 different soil types were tested and also clarified that other factors that might influence survival in soil, such as protozoal ingestion were not investigated.

- In response to a query on whether a static or dynamic model of exposure was used in the risk assessment Prof Strachan clarified that the model assumed an individual was exposed only once i.e. a static model was used. In order to attempt to capture accumulated exposures the model was run over several iterations over a long period of time to see if consistent results were returned.

73. ACMSF Chair (Prof Sarah O'Brien) thanked the presenters for an interesting talk on the RELU programme and noted the work would raise some interesting outcomes for risk managers.

Epidemiology of Foodborne Infections Group

74. The Committee received two updates on the deliberations of the Epidemiology of Foodborne Infections Group (EFIG) in 2011. In January [52] ACMSF were informed that EFIG discussed feedback from the ACMSF in terms of the request for information on trends and summaries of EFIG data, supported by figures and denominator data where possible. It was noted that provision of denominator data for animals was challenging as the data was based on reported isolations or incidents which have a

broader scope than for human isolations. There were also issues with using laboratory submission or animal population data as denominators. It was noted that EFIG would shortly consider a paper on animal denominator data and what information could be usefully provided.

75. Other items highlighted from the EFIG meeting included the January to June 2010 *Salmonella* in livestock reports and human pathogen data for January to September 2010. Reports of *S.* Enteritidis and *S.* Typhiumurium in livestock remained low and monophasic *Salmonella* 4,5,12:i:- continued to be isolated. Incidence rates for *Salmonella* in humans continued to decline whilst *Campylobacter* incidence was continuing to rise. Rates for *E. coli* O157 and *L. monocytogenes* in humans were lower in the first 9 months of 2010 than for the corresponding period last year. EFIG also considered a paper on possible reasons for the rise in *Campylobacter* cases which concluded the rise was likely to be real rather than due to changes in sampling and reporting. It was suggested that possible ways to investigate the issue further were to look at changes in MLST types, hospital bacteraemias or through sentinel surveillance based on existing networks. A scientific opinion on monophasic *S*. Typhimurium had also been published by EFSA in September 2010 which considered the public health risk from these strains.

76. The Committee made a number of comments on the update:

- It was noted that the reduction in the *L. monocytogenes* incidence rate in humans appeared significant and comparison with EU data was raised.

  The FSA responded that the figures represented low numbers so should be interpreted with caution but if the cases continued to decline they would be at the levels seen before the recent “spike” in listeriosis. The FSA was unaware of the recent figures for other EU countries.

- It was suggested that MLST typing *Campylobacter* from hospital bacteraemias would not give representative information on all human *Campylobacter* cases and may not help in understanding the recent general rise in *Campylobacter* cases.

- It was also noted that weather conditions over the last 12 months have been quite unusual and the freezing temperatures may have had an effect on *Campylobacter* in poultry. The FSA may need to consider this in discussions with its researchers.

77. In June[53] Members were informed that EFIG had discussed practicalities and difficulties in providing denominators for animal data which will be explored further by Animal Health and Veterinary Laboratories Agency. The provisional 2010 animal data for *Salmonella* (excluding data collected under the National Control Plans) were reported as well as an update on human foodborne pathogen incidence data for 2010. Other items discussed by EFIG included the Local Government Regulation and the HPA programme of national microbiological surveys, results from various surveys and analyses of *Campylobacter* in humans and animals and the European Food Safety Authority (EFSA) mandate regarding modernisation of meat inspection in the EU.)

78. The Committee raised several questions in relation to the paper. Clarification of the use of the term "levels" in relation to *Campylobacter* was requested. It was confirmed that *Campylobacter* cases have continued to increase in 2010 but at lower rates than in 2009. Concerning the FSA's *Campylobacter* risk management programme, FSA's assessor (Ms Liz Redmond) confirmed that the FSA's aim is to reduce the proportion of birds in the highest contaminated category. It was also clarified that data on the number of people tested for *Campylobacter* were not collated. Defra assessor (Mr Stephen Wyllie) reminded Members that the 2010 UK Zoonoses Report, which provides more detailed zoonoses data, was currently in preparation.

General Papers

Openness

79. The ACMSF Chair reminded Members that the possibility of holding open meetings of ACMSF Working and *Ad Hoc* groups had been discussed at the December 2009 Committee meeting. The Committee had, in principle, welcomed the commitment to greater openness but highlighted a need to ensure flexibility so that discussions were not inhibited and the quality of advice given to the FSA was not affected. The Committee had recommended the Secretariat consider the practicalities of a move to more openness.

80. Dr Sophie Rollinson (ACMSF Secretariat) outlined a suggested approach for increasing the openness of ACMSF sub group meetings[54]. Dr Rollinson explained that after reviewing procedures and openness of similar Committees the Secretariat proposed that:

- Meetings of Working and *Ad Hoc* groups will continue to be held in reserved business and a written summary of these meetings will be prepared for presentation at the following main Committee meeting. This summary will be published on the ACMSF website.

- A webpage is developed for all existing Working and *Ad Hoc* Groups to include information on their terms of reference, membership and meeting summaries. Minutes of subgroup meetings will be published on these pages once a Group's final report is published.

- Authors of papers that contain pre-published material and commercially sensitive information will be made aware of how the Group will handle this information and how the FOI Act applies to the Committee.

- These new procedures are implemented for the next scheduled meeting and reviewed in 12 months.

81. The Committee considered the proposals were workable and practical and would make the deliberations of Working and *Ad Hoc* groups more transparent. The Committee endorsed the proposals outlined.

A report of the quinquennial review of the ACMSF

82. In June the ACMSF Chair reminded Members that an independent quinquennial review of the ACMSF had taken place between January and March 2011 and a number of Members and stakeholders had been interviewed. Dr Sophie Rollinson (ACMSF Secretariat) updated Members on the outcome of the review[55]. The review had concluded there was still a need for the ACMSF with value to the FSA, other departments and stakeholders and the report had highlighted 6 examples of good practice by the Committee and made 12 recommendations. Members were invited to note the review and recommendations and to consider the Secretariat's comments and specific questions posed in paper ACM/1022 to assist the Secretariat in preparing a response to the recommendations.

83. The Committee made the following comments in discussing the recommendations:

Recommendation 1: The Chair and the Secretariat should ensure that the work of the Committee continues to be focused on where it can have most impact, value and relevance.
Recommendation 2: Horizon scanning should be undertaken on an annual basis. Recommendation 3: The process for determining the work programme should be improved and a forward work plan published with proposed timescales for the work.

- Members were content with the Secretariat's proposal to develop a more formal work planning process to be reviewed by the Chair, Committee and Secretariat. It was suggested the work plan should be viewed as a living document and the importance of maintaining flexibility to defer discussions, if necessary, was highlighted. Members

felt it was appropriate to undertake horizon scanning more frequently than at present and every 12-18 months was suggested. The possibility of using horizon scanning matrices was also raised. Members felt the work of existing sub-groups should be borne in mind when planning how to take forward issues identified through horizon scanning to ensure the burden of any additional work on the Secretariat and Members was not unmanageable. It was suggested that the frequency of ACMSF meetings and the potential for scheduling of subgroups with main meetings should be reviewed.

Recommendation 4: Completed work should be summarised in terms of outcomes and impact achieved. This should be updated to track known outcomes and impacts over time.

- Members were unclear how recommendation 4 should apply to a risk assessment committee. As the outcome of ACMSF risk assessments depended on how a risk was managed the Committee felt this recommendation was straying into risk management territory. They also highlighted that it was challenging to measure the outcomes and impact of advice and identify incidents that might have been prevented by specific advice. It was suggested that if ACMSF recommendations resulted in a change to FSA risk management advice, the outcome could be summarised for the Committee and the ACMSF annual report was suggested as the appropriate mechanism through which to provide this information.

Recommendation 5: It is recommended that the Committee takes greater steps to show evidence of scientific rigour by using the FSA's Good Practice Guidelines and Science Checklist more explicitly and also routinely considering whether peer reviews are appropriate for work on which the Committee's decisions are based.

- Members suggested that the way the Committee works, and in particular production of sub group reports, might have an impact on scientific rigour as reports were not always thought to be written by the people most qualified in the specific area under assessment. It was suggested that the Committee could operate more effectively by peer-reviewing and giving an oversight to risk assessments whose production was out-sourced. Sub-groups could maintain an involvement in scoping of out-sourced risk assessments. The Chair summarised that there was a need for careful thought on how *ad-hoc*

groups were used and the proposal to consider peer-review on a case by case basis was welcomed.

Recommendation 6: There is currently no ACMSF assessor appointed for Northern Ireland and it is recommended that FSA addresses that in the near future.
Recommendation 7: The Chair and Secretariat should consider Secretariat resources in terms of scientific expertise and amount of resource available when planning ACMSF's work programme and identify and address any gaps as appropriate.
Recommendation 11: There is a need to clarify the role and responsibilities of the assessors on the Committee.

- No specific comments were made on the proposed responses to recommendations 6, 7 and 11. The Chair noted that previous discussions in relation to horizon scanning and sub groups were relevant to recommendation 7.

Recommendation 8: The Committee should review the balance of expertise on the Committee at regular intervals in the context of the future work programme for the Committee.
Recommendation 9: It is recommended that in future the recruitment process for new members starts earlier, so that the new members are in place either before or by the end of the terms of the retiring members to provide continuity of membership for the Committee and the sub group work.

- Members supported the proposal for the Chair and Secretariat to review the balance of expertise on the Committee ahead of new appointments and to have new Members in place by the end of the terms of retiring Members.

Recommendation 10: It is recommended that new members have an induction meeting with the Secretariat.

- Members felt that short induction meetings for new Members would be useful and suggested issues such as the role of Members and background on recent Committee discussions could be covered.

Recommendation 12: The work of the ad hoc groups should in general be run to a tighter timescale with the timescale being agreed at the start of the group's work.

- Members noted the *Ad-Hoc* Group on Foodborne Viral Infections had a clear timeline for their work but it was agreed that a balance needs to be struck between progressing work rapidly and the availability and resources of Members and the Secretariat.

84. ACMSF Chair thanked Members for their comments. Prof O'Brien indicated that she would be providing the Committee's response to the quinquennial review report at the autumn 2011 General Advisory Committee on Science meeting.

Role of assessors

85. Following the quinquennial review of the ACMSF one of the recommendations (recommendation 11) in the report was for clarification to be provided on the role and responsibilities of assessors on the Committee. In September ACMSF Chair clarified the roles and responsibilities of ACMSF Assessors, ACMSF Members and the Secretariat[56]. FSA assessor (Ms Liz Redmond) suggested that the Committee consider whether it would be appropriate to have an ACMSF assessor from the Department of Health (DH) as there were overlapping DH policy interests and responsibilities on many items discussed at ACMSF. The Committee agreed this option should be explored.

Information papers

86. 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 2011 were:

NO. OF PAPER	NAME OF PAPER	MEETING NUMBER	DATE OF MEETING
ACM/1014	Outbreaks of infections Associated with Ready-to- Eat Food January 2011	74th	20 January 2011
ACM/1015	Update from other Scientific Advisory Committees	74th	20 January 2011
ACM/1016	Update on Codex Committee on Food Hygiene	74th	20 January 2011

ACM/1017	Items of possible interest from the literature	74th	20 January 2011
ACM/1018	Report from the American Academy of Microbiology	74th	20 January 2011
ACM/1019	LG Regulation/HPA Co-ordinated Food Liaison Group Study: Catering at Large Scale Events	74th	20 January 2011
ACM/1026	Update from other Scientific Advisory Committees	75th	27 June 2011
ACM/1027	Report from GACS Working Group on Risk Assessment and Risk Management	75th	27 June 2011
ACM/1028	Botulism Outbreaks and Toxin Types in Cattle, Sheep and Goats, 2010	75th	27 June 2011
ACM/1029	Summaries of ACMSF sub-group meetings	75th	27 June 2011
ACM/1030	Food Standards Agency magazine: Bite	75th	27 June 2011
ACM/1031	Items of possible interest from the literature	75th	27 June 2011
ACM/1038	Updates from other Scientific Advisory Committees	76th	22 September 2011
ACM/1039	Report of the *Salmonella Bareilly* outbreak in the UK 2010	76th	22 September 2011

ACM/1040	FSA survey of *Listeria monocytogenes* and other microorganisms in cooked sliced meat and pates at retail	76th	22 September 2011
ACM/1041	Final response to the recommendations of the 2011 quinquennial review of the ACMSF	76th	22 September 2011
ACM/1042	Final review of food safety behaviours in the home	76th	22 September 2011
ACM/1043	Items of possible interest from the literature	76th	22 September 2011
ACM/1044	Membership of current ACMSF ad hoc and working groups	76th	22 September 2011
ACM/1045	FSA Chief Scientist Report 2010	76th	22 September 2011
ACM/1046	2010 UK Zoonoses Report	76th	22 September 2011

ACMSF Working and Ad Hoc Groups

Ad Hoc Group on Foodborne Viral Infections

87. The *Ad Hoc* Group on Foodborne Viral Infections met five times in 2011. At its first meeting the Group agreed to focus their discussions on Norovirus, Hepatitis A and E and other new and emerging foodborne viral pathogens. Members agreed to define a framework for assessing the foodborne risks from viruses and indicated that they will consider the WHO foodborne virus matrix. The Group agreed to liaise with the European Food Safety Authority (EFSA) technical panel currently considering foodborne viruses and also to review actions taken to address the recommendations made in the 1998 ACMSF report on foodborne viral infections. At the second meeting, the Group reviewed the previous ACMSF report on foodborne viruses including the government response to the report, the WHO foodborne viruses report, the Codex report on

controlling viruses in foods and the preliminary data from the IID2 study, in relation to viruses. In discussing the scope of their report the Group agreed to focus on norovirus and Hepatitis E as priorities. The third meeting looked at risks from shellfish and fresh produce.

88. The fourth meeting considered sewage discharges and their impact on shellfisheries and the work of the Cleaner Seas Forum. The fifth meeting discussions focussed on Environmental Health Officers' perspectives on dealing with incidents and outbreaks of norovirus, the HPU response to norovirus outbreaks, environmental monitoring and detection methods for norovirus.

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

Ad Hoc Group on Vulnerable Groups

90. The *Ad Hoc* Group on Vulnerable groups met twice in 2011. The Group completed its work in relation to the risk from toxoplasma in the food chain. In drawing up a risk profile for toxoplasmosis in food the group had reviewed evidence on the prevalence of toxoplasmosis in humans, the estimated burden of disease, seroprevalence data in farmed and non-farmed animals, presence and survival in food, outbreaks and case-control studies and consumer advice given by other countries in relation to toxoplasmosis.

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

ACMSF Involvement in Incidents and Outbreaks

92. In August ACMSF was asked to comment (by the FSA) on a case control study which formed part of an investigation into an outbreak of VTEC 0157 PT8 in the UK. The ACMSF Chair and a small group of Members commented on the report as comments were required urgently and outbreak investigations were ongoing. A press release on the outbreak was subsequently published by the Health Protection Agency[57].

Outcome and Impact of ACMSF advice

93. Feedback on the outcome of ACMSF recommendations are provided to the Committee through matters arising papers, information papers and oral updates at meetings. Following the quinquennial review, it was also agreed to provide a summary of the outcome and impact of recommendations in the annual report where these have resulted in a reconsideration of FSA risk management actions or advice.

94. The FSA Board was updated on the outcome of ACMSF's consideration of the human health risks relating to unpasteurised milk consumption and also the specific risks associated with *M. bovis* and milk and milk products. A more detailed paper will be presented to the Board in 2012 setting out the current policy on unpasteurised milk and cream for direct human consumption and seeking their agreement to conduct a policy review.

95. The National Expert Panel on New and Emerging Infections (NEPNEI) was updated on ACMSF's ad hoc group on newly emerging infections consideration of Bovine Neonatal Pancytopenia (BNP). This newly emerging syndrome in calves had been referred to ACMSF by NEPNEI to consider potential risks through the food chain. NEPNEI were informed that the group were not able to come to a definitive opinion on microbiological risks from meat and milk from animals affect by BNP on the basis of the limited evidence available to them, including the unavailability of the results of a UK case control study in cattle. The issue will be considered again once these results are available.

96. During 2011 the Committee was informed about the *E. coli* O104 outbreaks in Germany and France and the involvement of various agencies and organisations in their investigation across the EU. A small sub-group was set-up to consider the issues in greater depth and provide expedient advice. This was used to inform the FSA's position in EU negotiations on-going at the time to establish new control measures designed to reduce the risk of a similar outbreak recurring in the future.

97. A subgroup of the Committee was asked by the FSA to comment on the results of a case control study which found significant associations between cases and exposure to certain raw vegetables (leeks and potatoes) in the home. The case control study formed part of the investigation into an outbreak of VTEC O157 PT8 infections which occurred in England, Wales and Scotland between December 2010 and July 2011. The subgroup considered that the case control study approach was generally appropriate, sound and consistent with other outbreak investigations and that the statistical analysis had been performed correctly and robustly and analysed in a logical, hierarchical manner. The exposure routes were considered plausible and the study findings suggested that microscopic or macroscopic soil contamination of raw root vegetables, particularly leeks and perhaps potatoes, may have been a potential source of the infections. The subgroup was supportive of reinforcing existing food safety advice about storage, handling and cooking raw vegetables. As a result of the outbreak together with findings from consumer research the FSA has reminded consumers to follow good hygiene practices when storing and preparing vegetables including washing raw vegetables to help minimise the risk of food poisoning.

98. The Committee noted there was a need to understand more about *Campylobacter* and chicken liver contamination following outbreaks involving chicken liver pate and parfait in recent years. Contamination may be internal as well as external, and in terms of the risk posed by *Campylobacter* chicken liver may need to be considered in the same way as comminuted meat rather than whole meat in the context of delivering appropriate food safety messages. The FSA is seeking to address some research gaps in this area and continues to emphasize the importance of not undercooking chicken liver pate and parfait dishes which ideally should be to a core temperature of 70°C for 2 minutes or equivalent.

99. Several areas highlighted in the Committee's report on vulnerable groups are being taken forward as part of the Agency's Listeria risk management programme. This includes the update of food safety advice for vulnerable groups highlighting higher risk foods and safer alternatives/alternative ways to consume the foods and the production of simple guidance for small producers in high-risk industry sectors and enforcement officers on the existing legal requirements for *L. monocytogenes* in ready-to-eat foods.

Chapter 3: A Forward Look

Future work programme

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

101. Under its horizon scanning activities the Committee will consider changing food preparation techniques in the hospitality sector that may impact on microbiological food safety.

102. Following the Committee's endorsement of the risk assessment framework used to consider the issue of *M. bovis* and unpasteurised milk and milk products, ACMSF will consider potential approaches to the Committee's risk assessments.

103. The Committee will address any issues raised from the public consultation on the *Ad Hoc* Group on Vulnerable Groups risk profile on toxoplasma in the chain and publish the report.

104. The A*d Hoc* Group on Foodborne Viral Infections will continue to review current information on viruses in food with the aim of producing their report in 2013.

105. 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.

106. 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 Group will also consider additional published data in relation to Bovine Neonatal Panycytopenia to assist in assessing whether there are any associated risks to human health.

107. Details of the Committee's work plan for 2012/13 can be found at Annex II.

Annex I

Papers Considered by ACMSF in 2011

NO. OF PAPER	NAME OF PAPER	MEETING NUMBER	DATE OF MEETING
ACM/1006	Matters arising	74th	20 January 2011
ACM/1007	Horizon scanning	74th	20 January 2011
ACM/1008	Raw milk	74th	20 January 2011
ACM/1009	Chicken liver pates	74th	20 January 2011
ACM/1010	Rural Economy and Land Use Programme	74th	20 January 2011
ACM/1011	Epidemiology of Foodborne Infections Group	74th	20 January 2011
ACM/1012	Openness	74th	20 January 2011
ACM/1013	Dates of future meetings	74th	20 January 2011
ACM/1014	Outbreaks of infections Associated with Ready-to- Eat Food January 2011	74th	20 January 2011
ACM/1015	Update from other Scientific Advisory Committees	74th	20 January 2011
ACM/1016	Update on Codex Committee on Food Hygiene	74th	20 January 2011
ACM/1017	Items of possible interest from the literature	74th	20 January 2011
ACM/1018	Report from the American Academy of Microbiology	74th	20 January 2011
ACM/1019	Local Government Regulation/HPA Co-ordinated Food Liaison Group Study: Catering at Large Scale Events	74th	20 January 2011
ACM/1020	Matters arising	75th	27 June 2011

ACM/1021	*Mycobacterium bovis* and the possible health risks associated with unpasteurised milk and milk products part II	75th	27 June 2011
ACM/1022	A report of the quinquennial review of the ACMSF	75th	27 June 2011
ACM/1023	Food and You Survey	75th	27 June 2011
ACM/1024	German *E.coli* outbreak	75th	27 June 2011
ACM/1025	Dates of future meetings	75th	27 June 2011
ACM/1026	Update from other Scientific Advisory Committees	75th	27 June 2011
ACM/1027	Report from GACS Working Group on Risk Assessment and Risk Management	75th	27 June 2011
ACM/1028	Botulism Outbreaks and Toxin Types in Cattle, Sheep and Goats, 2010	75th	27 June 2011
ACM/1029	Summaries of ACMSF sub-group meetings	75th	27 June 2011
ACM/1030	Food Standards Agency magazine: Bite	75th	27 June 2011
ACM/1031	Items of possible interest from the literature	75th	27 June 2011
ACM/1032	Matters arising	76th	22 September 2011
ACM/1033	Infectious Intestinal Disease Study 2	76th	22 September 2011

ACM/1034	Risk Profile in relation to toxoplasma in the food chain	76th	22 September 2011
ACM/1035	Waste and resource action Programme: Quality, safety and use of digestate in UK agriculture	76th	22 September 2011
ACM/1036	Role of assessors	76th	22 September 2011
ACM/1037	Dates of future meetings	76th	22 September 2011
ACM/1038	Updates from other Scientific Advisory Committees	76th	22 September 2011
ACM/1039	Report of the *Salmonella Bareilly* outbreak in the UK 2010	76th	22 September 2011
ACM/1040	FSA survey of *Listeria monocytogenes* and other microorganisms in cooked sliced meat and pates at retail	76th	22 September 2011
ACM/1041	Final response to the recommendations of the 2011 quinquennial review of the ACMSF	76th	22 September 2011
ACM/1042	Final review of food safety behaviours in the home	76th	22 September 2011
ACM/1043	Items of possible interest from the literature	76th	22 September 2011

ACM/1044	Membership of current ACMSF ad hoc and working groups	76th	22 September 2011
ACM/1045	FSA Chief Scientist Report 2010	76th	22 September 2011
ACM/1046	2010 UK Zoonoses Report	76th	22 September 2011
ACM/1047	*Mycobacterium bovis* and the possible health risks associated with unpasteurised milk and milk products	76th	22 September 2011

Annex II

ACMSF Forward Work Plan 2012/13

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. ACMSF catering members have been gathering intelligence to inform discussion on this topic.**	The Committee will consider changing food preparation techniques in the hospitality sector, their work to address it and an appropriate timescale in January 2012. The Committee will continue to undertake horizon scanning to identify potential future microbiological risks at 12-18 month intervals. New/emerging horizon scanning topics will be discussed in May	An ACMSF paper assessing the microbiological risk to consumers associated with changing food preparation techniques in the hospitality sector. The paper will be forwarded to the FSA for consideration.

	Topic	Progress	Expected Output
		2012.	
2	**Potential approaches to ACMSF risk assessments** The Secretariat has undertaken to present options for future approaches to risk assessment for discussion by the Committee.	The Committee will consider risk assessment approaches in January 2012.	An agreed risk assessment framework for future working of the Committee.
3	**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 by May 2012. ACMSF received a presentation on WRAPs risk assessment on the quality, safety and use of digestate in UK agriculture in September 2011. A subgroup of Members has agreed to provide comment on the report. The Committee will agree its comments on the digestates report in January 2012.	A response from the ACMSF on the WRAP risk assessment reports. Response will be forwarded to WRAP.

4	**Internalisation of pathogens by plant hosts**	The Committee's views have previously been sought on food safety advice in relation to fresh produce. Research on the internalisation of foodborne pathogens in plant hosts and any implications for advice on their safe preparation will be considered by the Committee. A presentation will be given at the May 2012 meeting and views of the Committee sought.	ACMSF's views on key evidence gaps and research required to establish the implications for human health.
5	**Toxoplasma in the food chain**	The *Ad Hoc* Group on Vulnerable Groups has drafted their risk profile on toxoplasma in the food chain. The Committee approved the draft for consultation. An amended final report addressing any consultation responses will be presented to the Committee for endorsement in May 2012.	An ACMSF report outlining a risk profile for toxoplasma in the food chain. Report and recommendations will be forwarded to the FSA.

6	**Foodborne Viral Infections**	*The Ad Hoc* Group on Foodborne Viral Infections is currently gathering evidence for their report. The subgroup is expected to present its draft report to the Committee by January 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.
7	**Newly Emerging Pathogens**	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 group will also consider any human health risks through the foodchain from Bovine Neonatal Pancytopenia (BNP). The subgroup will meet to discuss BNP and report back to the Committee by May 2012.	The Committee to draw the FSA's attention to any risk to human health from ESBL producing *E.coli* in the food chain. An ACMSF statement on human health risks through the food chain from BNP.

8	**Microbiological Surveillance of food** The Surveillance Working Group will continue to provide advice as required in connection with the FSA's microbiological food surveillance programme and any other surveillance relevant to foodborne disease.	Continuous. The Group will consider the protocols for forthcoming surveys on *Campylobacter* in chicken and *Listeria* in cooked meat by December 2012.	Surveillance Working Group comments on survey protocols and survey results for consideration by FSA in their microbiological food surveillance programme.
9	**Developing trends in relation to foodborne disease** The Committee will continue to receive updates on research, surveys, investigations, meetings and conferences of interest.	EFIG[1] updates will be provided at the January and May 2012 meetings. The Committee will be updated on current activities in relation to the microbiological safety of sprouted seeds in January 2012. The findings from research into food safety behaviours in the home will be presented at the May 2012 meeting. An update on the outcomes of the workshop on the Application of Molecular Epidemiology to Investigations of Outbreaks will be provided in May 2012. The results of research to estimate the burden of foodborne disease will be presented to the Committee in September 2012.	ACMSF comments on the updates it receives for the FSA's consideration.

[1] Epidemiology of Foodborne Infections Group

10	**International and EU developments on the microbiological safety of food** The Committee will continue to be updated on issues of relevance and significant developments at an EU and international level on microbiological food safety such as EFSA opinions and Codex food hygiene meetings.	EFSA's scientific opinion on STEC and seeds/sprouted seeds will be discussed in January 2012.	ACMSF to note updates and provide comments if desired
11	**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

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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 Vulnerable Groups

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

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

Ad Hoc Group on Foodborne Viral Infections

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

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

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

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

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

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

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

- Report on these matters by January 2013.

Membership Tables

		ACMSF	Surveillance Working Group	Newly Emerging Pathogens Working Group
Chairman				
Professor S J O'Brien	Professor of Infection Epidemiology and Zoonoses, University of Liverpool, Institute of Infection and Global Health, National centre for Zoonosis Research	✓	✓	✓
Members				
Dr G Adak[2]	Head of Gastrointestinal Infection Surveillance, Department of Gastrointestinal, Emerging & Zoonotic Infections, Health Protection Services Colindale	✓	✓	
Mr J Bassett	Team Leader, Microbiological Safety, Unilever Safety & Environmental Assurance Centre	✓		
Dr R Betts[3]	Head of Food Microbiology, Campden BRI	✓	✓	
Dr D W G Brown[4]	Director, Virus Reference Department, HPA Centre for Infections, 61 Colindale Avenue, London NW9 5HT	✓		✓

[2] Appointed 1 April 2011
[3] Appointed 1 April 2011
[4] Appointment ended 31 March 2011

		ACMSF	Surveillance Working Group	Newly Emerging Pathogens Working Group
Mrs V Buller	Catering Adviser. School Food Consultant Service Improvement Consultant	✓		
Professor J Coia[5]	Consultant Microbiologist, NHS Greater Glasgow and Clyde	✓	✓	
Mrs R Glazebrook	Consumer representative	✓		
Professor J Gray[6]	Professor of Clinical Virology, University of East Anglia & Hon. Consultant Clinical Scientist, Specialist Virology Centre, Norfolk and Norwich University Hospitals	✓		
Dr R E Holliman	Consultant and Reader in Clinical Microbiology, St George's Hospital, London	✓		✓
Ms J Hopwood[7]	Company Microbiology, Marks & Spencer	✓	✓	
Professor T J Humphrey[8,9]	Professor of Food Safety, University of Liverpool	✓	✓	
Professor P R Hunter[10,11]	Professor of Health	✓		✓

[5] Chair of Surveillance Working Group
[6] Appointed 1 April 2011
[7] Appointed 1 April 2011
[8] Chair of the Surveillance Working Group until 31 March 2011
[9] Appointment ended 31 March 2011
[10] Chair of the Newly Emerging Pathogens Working Group until 31 March 2011
[11] Appointment ended 31 March 2011

	Protection, University of East Anglia			

		ACMSF	Surveillance Working Group	Newly Emerging Pathogens Working Group
Mr A Kyriakides[12]	Head of Product Quality, Safety & Supplier Performance, Sainsbury's Supermarkets	✓	✓	✓
Professor D McDowell	Professor of Food Studies University of Ulster	✓	✓	✓
Mr P McMullin	Senior Veterinarian & Managing Director, Poultry Health Services	✓		✓
Dr S Millership	Consultant in Communicable Disease Control, Essex Health Protection Unit and Consultant in Microbiology, Princess Alexandra Hospital, Harlow	✓		
Mr D Nuttall	Catering Manager Harper Adams University College	✓		
Mrs J Morris	Principal Policy Officer (Food), Chartered Institute of Environmental Health	✓		
Professor P H Williams[13]	Professor of Microbiology, Dept. of Genetics, University of Leicester	✓		✓
Assessors				
Mr S Wyllie	Department for Environment, Food and Rural Affairs	✓		✓
Ms Liz Redmond	Food Standards Agency	✓		

[12] Appointment ended 31 March 2011
[13] Chair of Newly Emerging Pathogens Working Group from 1 April 2011

Dr Susanne Boyd	Food Standards Agency (Northern Ireland)	✓		
Dr J McElhiney	Food Standards Agency (Scotland)	✓		
Mr S Wearne	Food Standards Agency (Wales)	✓		
Secretariat				
Administrative Secretary Ms G Hoad	Food Standards Agency	✓	✓	✓
Scientific Secretary Dr P E Cook	Food Standards Agency	✓		
Administrative Secretariat				
Dr S Rollinson	Food Standards Agency	✓	✓	✓
Mr A Adeoye	Food Standards Agency	✓	✓	✓
Miss S Butler	Food Standards Agency	✓	✓	✓
Scientific Secretariat				
Mr Adam Hardgrave	Food Standards Agency		✓	

		***Ad Hoc* Group on Vulnerable Groups**	***Ad Hoc* Group on Foodborne Viral Infections**
Members			
Mr J Bassett		✓	
Dr D W G Brown[14]			✓
Professor J Coia		✓	
Mrs R Glazebrook			✓
Professor P R Hunter		✓	
Dr R Holliman[15]		✓	
Mr A Kyriakides		✓	✓
Dr S Millership			✓
Mrs J Morris		✓	✓
Professor S J O'Brien[16]			✓
Co-opted Members			
Dr E Guy	Toxoplasma Reference Unit, Public Health Wales	✓	
Mr Paul Hutchinson	Animal Health and Veterinary Laboratories Agency	✓	
Dr N Cook	Food and Environment Research Agency		✓
Dr D Lees	Centre for Environment, Fisheries & Aquaculture Science		✓

[14] Chair of *Ad Hoc* Group on Foodborne Viral Infections until retirement in 31 March 2011 when he was co-opted as a member of Group
[15] Chair of *Ad Hoc* Group on Vulnerable Groups
[16] Chair of *Ad Hoc* Group on Foodborne Viral Infections from 1 April 2011

		***Ad Hoc* Group on Vulnerable Groups**	***Ad Hoc* Group on Foodborne Viral Infections**
Assessors			
Mr S Wyllie	Department for Environment, Food and Rural Affairs	✓	✓
Secretariat			
Administrative Secretariat			
Dr S Rollinson		✓	✓
Mr A Adeoye		✓	✓
Miss S Butler		✓	✓
Scientific Secretariat			
Miss L Knowles			✓

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				
Mr J Bassett	Unilever plc	Employee		
Dr R Betts				
Dr D W G Brown	None		Various	HPA industry-funded research and laboratory investigations
Mrs V Buller	Local Authorities and Schools Association for Public Service Excellence	Catering Adviser and Food Service Consultant Honorary Member of the Local Authority Caterers Association.	Food Standards Agency School Food Trust	Evaluation of Local Authority Food & Hygiene applications and other education related projects. Consultancy
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				
Dr R E Holliman	Various	Medical Legal work on toxoplasmosis and hospital acquired infection	None	

Member	Personal interests		Non-personal interests	
	Name of company	**Nature of interest**	**Name of company**	**Nature of interest**
Mr J Hopwood				
Professor T J Humphrey	British Egg Industry Council McDonalds Ltd	*Ad hoc* consultancy work *Ad hoc* consultancy work	Various	Funding for research projects
Professor P R Hunter	Suez International Paris Institute for Public Health & Water Research	Chair of Science Advisory Committee Chair of Board of Directors Medical/Legal advice regarding Travel Health	Chambre Syndicale des Eaux Minérales, Paris	Study of Antibiotic Resistance in Food & Water in France
Mr A Kyriakides	J Sainsbury plc Sainsbury's Supermarkets Ltd Campden BRI	Shareholder Employee Member of Council & Executive	None	
Professor D McDowell	University of Ulster Agrifood Bioscience Institute	Employee Deputy Chair	Companies in food processing/retail FSA	Consultancy/Research funding with industry Participation in the preparation of a research proposal, in collaboration with Ipsos MORI - Domestic Kitchen Practices FS244026. Consultancy report on reusable plastic bags – in collaboration with British Hospitality Association
Mr P McMullin	Poultry Health Services (PHS) Ltd	Employee and shareholder	Various through PHS Ltd	Consultancy, Veterinary care, Laboratory services
Dr S Millership	None		None	

Member	**Personal interests**		**Non-personal interests**	
	Name of company	**Nature of interest**	**Name of company**	**Nature of interest**
Mrs J Morris	Chartered Institute of Environmental Health Whitbread plc	Employee and Member Shareholder	None	
Mr D Nuttall	Harper Adams University College	Catering Manager		
Professor P H Williams	None		None	
***Ad Hoc* Group on Foodborne Viral Infections**				
Dr N Cook	None		None	
Dr D Lees	None		None	
***Ad Hoc* Group on Vulnerable Groups**				
Dr E Guy	None		None	
Mr P Hutchinson	None		None	

Annex V

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

Public service values

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

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

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

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

Standards in public life

All Committee members must:

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

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

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

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

Role of Committee members

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

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

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

- follow Agency guidelines on divulging any information provided to the Committee in confidence;

- ensure that an appropriate response is provided to complaints and other correspondence, if necessary with reference to the Agency; and

- ensure that the Committee does not exceed its powers or functions.

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

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

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

The role of the Chair

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

- ensuring that the Committee meets at appropriate intervals, and that the minutes of meetings and any reports to the Agency accurately record the decisions taken and, where appropriate, the views of individual members;

- representing the views of the Committee to the general public, notifying and, where appropriate, consulting the Agency, in advance where possible; and

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

DEPARTMENTAL ASSESSORS AND THE SECRETARIAT

Departmental assessors

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

The Secretariat

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

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

Handling conflicts of interest

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

(i) Declaration of Interests to the Secretariat

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

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

(ii) Declaration of Interests and Participation at Meetings

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

- their interest is direct and pecuniary; or

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

* Close family members include personal partners, parents, children, brothers, sisters and the personal partners of any of these.

Personal liability of Committee members

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

Appendix 1

THE SEVEN PRINCIPLES OF PUBLIC LIFE

Selflessness

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

Integrity

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

Objectivity

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

Accountability

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

Openness

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

Honesty

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

Leadership

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

Appendix 2

DIFFERENT TYPES OF INTEREST

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

Personal Interests

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

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

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

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

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

Non-Personal Interests

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

- **Fellowships:** the holding of a fellowship endowed by the industry;

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

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

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

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

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

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

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

DEFINITIONS

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

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

- Trade associations representing companies involved with such products;

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

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

Annex VI

GOOD PRACTICE GUIDELINES FOR THE INDEPENDENT SCIENTIFIC ADVISORY COMMITTTEES

PREAMBLE

Guidelines 2000: Scientific Advice and Policy Making[17] 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*[18] (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*[19] 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.

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**.**

[17] Guidelines on Scientific Analysis in Policy Making, OST, October 2005. Guidelines 2000: Scientific advice and policy-making. OST July 2000
[18] Code of Practice for Scientific Advisory Committees, OST December 2001
[19] Report on the Review of Scientific Committees, FSA, March 2002

THE GOOD PRACTICE GUIDELINES

These Guidelines have been developed by 9 advisory committees:

Advisory Committee on Animal Feedingstuffs[20]
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[21]
Committee on Mutagenicity of Chemicals in Food, Consumer Products and the Environment[22]
Committee on Toxicity of Chemicals in Food, Consumer Products and the Environment[23]
Scientific Advisory Committee on Nutrition[24]
Spongiform Encephalopathy Advisory Committee[25]

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.

[20] FSA Secretariat
[21] Joint FSA/HPA Secretariat, HPA lead
[22] Joint FSA/HPA Secretariat, HPA lead
[23] Joint FSA/HPA, FSA lead
[24] Joint FSA/DH Secretariat
[25] Joint Defra/FSA/DH Secretariat

Twenty seven principles of good practice have been developed. However, the different committees have different duties and discharge those duties in 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[26].

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.

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

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

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

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

Drawing conclusions

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

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

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

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

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

Communicating committees' conclusions

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

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

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

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

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

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

Glossary of Terms

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

Bacteraemia: Presence of bacteria in the bloodstream.

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.

D value: The time required at a certain temperature to kill 90% of the organisms being studied

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

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.

Mastitis is the inflammation of breast tissue. *S. aureus* is the most common etiological organism responsible, but *S. epidermidis* and streptococci are occasionally isolated as well.

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

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

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

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

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

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

Toxoplasma: A parasitic protozoa which causes toxoplasmosis in humans

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

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

VTEC: Verocytotoxin 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

EFIG: Epidemiology of Foodborne Infections Group

EFSA: European Food Safety Authority

ESBL: Extended-Spectrum-beta-lactamase

FOI: Freedom of Information

FSA: Food Standards Agency

GACS: General Advisory Committee on Science

HAIRS: Human Animal Infections Risk Surveillance Group

HPA: Health Protection Agency

HPU: Health Protection Unit

IID: Infectious Intestinal Disease

MAP: *M. avium* subspecies *paratuberculosis*

MLST: Multilocus Sequence Typing

OCPA: Office of the Commissioner for Public Appointments

RASFF: Rapid Alert System for Food and Feed

SSRC: Social Science Research Committee

TB: Tuberculosis

TSE: Transmissible Spongiform Encephalopathy

VLA: Veterinary Laboratories Agency

VTEC O157: Verocytotoxigenic *Escherischia coli* O157

WRAP: Waste and Resources Action Programme

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