

**MINUTES OF THE MEETING OF THE ADVISORY COMMITTEE ON THE
MICROBIOLOGICAL SAFETY OF FOOD (ACMSF) HELD VIA MICROSOFT
TEAMS ON 19 APRIL 2021 (NINETY-EIGHTH MEETING)**

Present

Chair: Prof Bill Keevil

Members:

Dr Gary Barker
Dr Gauri Godbole
Prof Peter McClure
Mr Alec Kyriakides
Dr Dan Tucker
Dr Gwen Lowe
Mrs Ann Williams
Miss Heather Lawson
Mrs Emma Hill
Dr Jane Gibbens
Dr Wayne Anderson
Prof Francis Butler
Dr Edward Fox
Mr Martin Briggs

Departmental
representative: Dr Steve Wyllie (Defra)

FSA Science Council: Prof Jonathan Wastling

Head of the FSA's Science, Evidence Research Division (SERD): Prof Rick Mumford

Secretariat: Dr Paul Cook
Dr Manisha Upadhyay
Mr Adekunle Adeoye
Ms Azuka Aghadiuno

Presenters: Dr Iulia Gherman
Miss Victoria Cohen
Prof Noel McCarthy
Prof Martin Maiden

Members of the public: see Annex 1.

1. Chair's introduction

1.1 The Chair welcomed members of the committee and members of the public to the 98th meeting of the ACMSF. He also welcomed Prof Rick Mumford (Head of the FSA's SERD), Dr Iulia Gherman (FSA, Microbiological Risk Assessment, SERD)

who presented agenda item 6 (Proposed working group on botulinum toxin-producing Clostridia and vacuum packaging and associated processes), Miss Victoria Cohen (FSA, Microbiological Risk Assessment, SERD) who presented agenda item 7 (Literature review on Botulism in Cattle, Sheep and Goats), Prof Noel McCarthy (University of Warwick) and Prof Martin Maiden (University of Oxford) who presented agenda item 14 (*Campylobacter* source attribution).

1.2 Before the meeting started the Chair recognised the presence of Dr Roy Betts who attended the meeting as an observer. His term on the committee ended on 31 March 2021 after serving the maximum allowed 10 years on a public body. Dr Betts was thanked for his diligent service to the committee. He actively contributed at plenary meetings and served on five of the committee's subgroups chairing two of them during his tenure. It was noted that Dr Betts always agreed to carry out tasks for the committee when called upon even at short notice such as chairing the committee's horizon scanning workshop that was held in June 2020.

2. Apologies for absence

2.1 None.

3. Declaration of interests

3.1 The Chair asked Members if they wished to declare any potential conflicts of interest associated with the agenda items to be discussed. The Chair confirmed that he has a PhD student that is being funded by Vitacress Salads. Dr Barker declared that he has carried out work on vacuum and modified atmosphere packed chilled foods funded by a variety of industry groups. Dr Janecko declared that she has ongoing research on *Campylobacter* in the food chain funded by Biotechnology and Biological Sciences Research Council for *Campylobacter* in the food chain.

4. Minutes of the 97th meeting

4.1 Members approved the minutes of the 97th meeting as an accurate record and agreed that they should be posted on the ACMSF website.

Action

5. Matters arising

5.1 Paper ACM/1350 provided a summary of actions on matters arising from previous meetings. Dr Paul Cook reported that:

- Minutes of the 96th meeting had been posted on the website.
- **Horizon scanning workshop 2020** summary of discussions and outputs: Secretariat to provide a progress report at the next plenary meeting. A report was provided in paper ACM/1355.

- **Epidemiology of Foodborne Infections Group:** Secretariat to share EFIG's terms of reference with the Committee. This was emailed to members.
- Increase of non-regulated serovars in broiler flocks linked to the EU ban on the use of formaldehyde. Information on alternatives to formaldehyde and other relevant material to be circulated to members. Papers ACM/1362 (*Salmonella* contamination and its control in animal production), ACM/1363 (Control of *Salmonella* and pathogenic *E. coli* contamination of animal feed using alternatives to formaldehyde-based treatments) and ACM/1364 (An observational and educational study package on the epidemiology and control of *Salmonella* in broiler production) refers.
- **STEC Research in Scotland:** Send Food Standards Scotland relevant material on Republic of Ireland's STEC environmental work. Information was sent to FSS.
- Update FSS on whether the proposed study looking at the prevalence of *Salmonella* in sheep in England and Wales (sampling cecal contents at abattoirs) will cover *E. coli*. The proposed study was likely to include *E. coli* and FSS was updated.
- FSS to be provided with copy of APHA's study report which looked at the dynamics of *E. coli* in cattle herd and super-shedders. The report was sent to FSS.
- **Review of Antibiotic Use in Crops, Associated Risk of AMR and Related Research Gaps.** Reviewed in August/September 2020. Report was prepared by FERA Ltd for Defra and the FSA. Report was sent to the committee.
- **Information paper ACM/1323 TBEV – draft risk assessment in relation to food that was considered at the January 2020 plenary:** As advised by a member, secretariat to ask risk assessment author to categorise the section relating to raw drinking milk as “high uncertainty” as the paper is unclear on the number of people that drink raw milk in the 2 specified areas. This should be reflected in the paper's summary statement/final remark. Information was relayed to the FSA.
- Secretariat to draw the risk assessment author's attention to a point raised on the risk assessment regarding the current ACMSF classification of overall microbiological risk from RDM (page 1: paragraph 2). This should be corrected to “medium” not “low”. Information was relayed to the FSA. A member flagged (at the 19 April 2021 meeting) that comments made by the committee on risk assessments should be considered when revising the risk assessment
- Tick-borne encephalitis virus (TBEV) – draft risk assessment in relation to food: The Human and Animal Infections and Risk Surveillance group (HAIRS) are in the process of publishing their risk assessment on TBEV. Risk assessment was sent to members via correspondence.

- **Literature review on botulism in cattle, sheep and goats: 2006 to 2019** to be revised to reflect comments made by members. Revised report was discussed at April 2021 meeting (paper ACM/1352 refers).
- Public Health England/Animal and Plant Health Agency officials to provide formal response to address query on how **updates on the activities of the EFIG** are presented to the Committee. Actioned by the secretariat and awaiting responses.

6. Proposed working group on botulinum toxin-producing Clostridia and vacuum packaging and associated processes (ACM/1351)

6.1 The Chair reminded members that at the October 2020 plenary meeting the committee discussed the recommendation made by the subgroup on non-proteolytic *Clostridium botulinum* and vacuum and modified atmosphere packaged food in their report published in January 2020 in relation to reviewing the ACMSF's 1992 report on vacuum packaging and associated processes. The comments made at the October meeting were passed to the FSA for consideration.

6.2 The Chair invited Dr Iulia Gherman to present paper ACM/1351 (proposed working group on botulinum toxin-producing Clostridia and vacuum packaging and associated processes) that outlined the FSA's request to the committee on revisiting key areas of the 1992 report. Members noted that following the October 2020 plenary meeting an FSA working group with industry representation discussed updating the FSA guidance on VP/MAP foods. This working group conducted an international review of legislation and guidance related to VP/MAP chilled fresh beef, lamb and pork and the FSA subsequently carried out a public consultation on its guidance (which was amended in December 2020). The revised guidance no longer applies to VP/MAP chilled fresh beef, lamb and pork. The guidance underlined that if a food business chooses to apply the guidance for chilled fresh beef, lamb and pork a 13-day maximum shelf-life may be applied.

6.3 Paper ACM/1351 specifically asked the committee to establish a subgroup to consider the risks of botulism associated with vacuum packaged and modified atmosphere products highlighting areas of consideration for the group which include providing advice:

- On the safety and shelf-life of VP/MAP chilled foods in relation to the risk of non-proteolytic *Clostridium botulinum* based on current industry practices. This includes a consideration of the scientific evidence, technological developments, the use of modelling tools, the history of safe use of VP/MAP products, as well as an overview of all foodborne botulism cases and outbreaks in the UK and worldwide (including those linked to ambient-stable foods and home-produced foods). Consideration should also be given to the risk of botulism from toxin-producing Clostridia other than *C. botulinum*.
- On the safety and shelf-life of VP/MAP low oxygen ambient-stable foods, as they are potential sources for cases of foodborne botulism.

- Technological advances that the group may wish to consider when reviewing this area.

6.6 Paper ACM/1351 included a draft term of reference, the timescale envisaged, structure of meetings and the anticipated output from the subgroup.

6.7 Draft terms of reference

- Review the risk posed by botulinum toxin-producing Clostridia in vacuum and modified atmosphere packaged chilled foods.
- A preliminary assessment of the risk posed by botulinum toxin-producing Clostridia in vacuum and modified atmosphere packaged ambient-stable foods.
- Where appropriate, consider other risk-related evidence relevant to this topic during the lifetime of the group.

6.8 Members were asked to:

- Indicate whether they are content to proceed with establishing a working group as outlined in this paper.
- Identify the priority issues which the working group will need to address.
- Comment on the draft terms of reference, approach and timescale envisaged for this task.

6.9 The following comments were made by members:

- Members were supportive of the FSA's request to setup a subgroup to consider the issue of botulinum toxin-producing Clostridia and vacuum packaging and associated processes.
- As the proposed scope of work suggests an extension to cover ambient stable modified atmosphere in vacuum package foods, a member asked whether this leaves out foods that would not be vacuum packed (foods packed in air or foods that have been processed with other systems to keep them stable with respect to *C. botulinum*). He queried whether the expression vacuum-packed or modified atmosphere packed ambient stable foods would limit the scope of the review. He flagged whether the committee was happy with the limitation of scope?
- Approach for proposed review should be from the perspective of foods that are capable of supporting the growth rather than how they are packaged. Looking at any conditions that might be conducive for the growth of *C. botulinum*, or any species producing botulinum toxin in foods. This will cover foods like packaged mushrooms (that are not VP/MAP) that might be chilled or ambient that could in theory support the growth of *C. botulinum* or chilled soups, that could support the growth of *C. botulinum* and they are neither vacuum packed or modified atmosphere packed. The subgroup's work should make sure that it does not exclude foods such as the above-mentioned products by just limiting the review to vacuum packed and modified atmosphere packed products.

- A member highlighted that the proposed scope of work has introduced new hazards/several new risks that the group would have to consider. He explained that once you introduce ambient temperature, proteolytic *C. botulinum* is relevant because it grows at ambient temperatures whereas non-proteolytic *C. botulinum* grows at chill temperatures.
- Reference was made to products that may need special treatment such as infant formula. The question of whether it will be in the scope or not was highlighted. Members noted that infant formula has a history of unique risk assessment separate from risk assessments that have been considered in relation to the development of the current FSA guidance. It was pointed out that infant formula has produced several incidents across the world in the past 20 years.
- Commenting on the terms of reference in relation to chilled foods, a member underlined that it should be clear that the assessment does not cover chilled foods that are not appropriately stored and distributed. He suggested that the terms of reference could indicate that the review is looking at chilled foods, distributed and stored at eight degrees centigrade or less". It was added that some known outbreaks of non-proteolytic *C. botulinum* have been associated with temperature abuse.
- Terms of reference should be very specific about exclusion of particular meats that were covered in the January 2020 report as a risk management decision has already been made and guidance has been updated.
- Concept of a preliminary assessment was odd to a member and questioned what the FSA meant by the preliminary assessment as opposed to the risk assessment.
- ACMSF Scientific Secretary commented on the ambient issue. He stated that if it is included, it will require some careful framing of the boundaries because of the reference made to infant formula. He pointed out that several other products could be caught in the review such as honey and other products (bakery type products) where spores could be present. He underlined that scope of work would have to be very carefully defined for the group to be able to deliver the report in the suggested timeframe.
- Members noted that terms of reference may have been driven by the many ambient extended life products such as bakery type products. It was mentioned that over the years there have been a significant increase in products that would historically have spoiled overtly.
- In relation to the comments made on ambient foods, Dr Gherman commented that the FSA's thinking was in line with bullet point 3. There are lots of new products on the market (fruits and vegetables) that have been modified atmosphere packed, or that have been introduced in the last 10 to 15 years that the FSA may not have considered in its guidance. She recognised that as there may be time constraints on considering ambient products she suggested carrying out a literature review which might be used to inform the subgroup's

deliberations. Concerning other hazards Dr Gherman indicated that based on discussions within the FSA the focus of the subgroup should be on toxin producing Clostridia.

6.10 In conclusion, the committee welcomed the setting up of the subgroup but underlined that its scope should not exclude foods that do support growth of *C. botulinum* that are not modified atmosphere pack and not vacuum packed.

7. Literature review on botulism in cattle, sheep and goats: 2006 to 2021 (ACM/1352)

7.1 The committee at the October 2019 plenary meeting considered the FSA's systematic literature review on botulism in cattle, sheep and goats. Comments made on the literature review were used to revise the document circulated to members. Victoria Cohen was invited to introduce paper ACM/1352 (the revised systematic literature review on botulism in cattle, goats and sheep). For the benefit of new members, it was reported that the committee was considering paper ACM/1352 to revisit the issue of botulism in cattle, sheep and goats to identify any new information since the committee's 2006 and 2009 reports. The 2006 report assessed the risk to human health posed by botulism in cattle and the 2009 report assessed the risk to human health posed by botulism in sheep and goats.

7.2 Miss Cohen reported that paper ACM/1352 has tried to address the comments made at the October 2019 meeting and the literature search was updated up to 1 March 2021.

7.3 The Committee was asked:

- Whether it is content that its comments from the October 2019 meeting have been addressed, and this review can be signed off or,
- If it has any further comments to be addressed.

7.4 The following comments were made:

- Work done on the literature review has been thorough. However, the committee felt more work was needed to make the 25-page report more accessible such as making the report's abstract comprehensive bringing out clearly any new information found in the course of the revision. It was highlighted that the abstract that nicely outlined the recommendations in the 2006 and 2009 reports should indicate whether those recommendations were taken forward and which ones were outstanding. For example, if there was research yet to be commissioned or what the FSA has agreed to do with all the recommendations. Knowing what the FSA has done with the report's recommendations was flagged as important feedback for the committee.
- Attention was drawn to inconsistencies in the report. Digits in figure 3 (percentage of cases attributed to poultry litter as the cause) were pointed out as unrelated to the digits in the accompanying text.

- Although paragraph 447 mentions papers containing information on the novel detection methods for neurotoxin, three of the papers discuss the use of qPCR for detection of BoNT genes.
- Report talked about colonial appearance using microscopy. This is possibly cell morphology rather than colonial appearance (member who made remark is convinced this should be cell morphology). It was added that reference in relation to above is not in the reference list (PHE 2016).
- Paragraph 581 to 584 refers to a study by Abdel Moein et al 2016 the sentence discussed faeces testing positive for BoNT, *C. botulinum*, or spores and blood tests may show increased antibody production. Information on the presence of spores is in the paper but there is nothing on antibody production. Is the correct reference cited in this section?
- Paragraph 731 to 742: reference to type B spores are more heat resistant than type A spores which could cause an issue if the frequency of animal cases caused by type B *C. botulinum* were to increase. This statement was queried. A member explained that he was unaware that anyone distinguished between heat resistance of type proteolytic types A and B, because they're so close. It was explained that most people regard them to be the same in terms of the heat resistance and wondered what is supporting this statement.
- Paragraph 749 to 756: This section discussed asymptomatic cattle testing positive for *C. botulinum* and highlighted the significance of this in relation to using this finding to inform risk-based decision for “raw” unpasteurised drinking milk. A member stated that he did not think this evidence alone would allow you to establish whether asymptomatic carrier animals do pose a risk to human health.
- Paragraph 764 to 769: discussion on how *C. botulinum* spores get into milk. It was felt that this section was light and needed more information. Miss Cohen was referred to the publication “*C. botulinum* A Practical Approach to the organism and its control in food written by Alec Kyriakides and Chris Bell”. It was explained that the book provides a good description of how milk can be contaminated during the production process.
- A member of the group that produced the botulism in cattle report drew attention to the French study cited in the literature review that mentioned outbreaks in France associated with toxin types A, B and E. He said the recommendation in the ACMSF report concerning toxin types was “If evidence emerges of other toxin types such as A, B and E causing outbreaks in UK cattle populations the question of making botulism in cattle notifiable should be reviewed”. He remarked that if the finding from the French study is correct that triggers the need for ACMSF to revisit its recommendation made in the 2006 report.
- Table 1 (Taxonomic lineages of *C. botulinum* with the strains most commonly affecting each organism) was queried. It was pointed out toxin F occurs in both I and II.

- Hazards associated with milk would be difficult to assess in large scale milk production because of the effect of pooling. Should there be asymptomatic animals it would be very difficult to measure an increase in risk because of the pooling effect.
- A member suggested including grey literature in the literature search. He explained that various incidents relating to botulism in the United States 20 years ago and the studies carried out were mostly covered in non-peer review journals. He added that there might be relevant information about activation of toxins and the pooling effect of the milk supply in the grey literature.
- Literature review highlighted asymptomatic carriage in poultry in relation to cross-contamination by proximity of cattle, sheep, and goats to poultry holdings. Advice may be needed highlighting the risk of cross-contamination from proximity to poultry holding.
- The committee would like the FSA to provide an update on how they responded to the research recommendations in the 2006 and 2009 reports. **ACTION.**
- ACMSF Scientific secretary welcomed the comments made by members on the literature review. He said these would be used to revise the report. He agreed that if there is sufficient evidence to suggest a need to revisit the recommendations made in 2006 report, the secretariat will examine this and report back to the committee with the revised literature review and proposals for next steps on the issue. **ACTION.**

7.5 In conclusion, the Chair indicated that the actions from the discussion were a revised literature review taking members comments into account, looking into the need to revisit the 2006 ACMSF report on botulism in cattle (following the gathering of information on outbreaks associated with toxin types A B and E) and presenting a short paper to the committee on how the FSA responded to the research recommendations in the 2006 (botulism in cattle) and 2009 (botulism in sheep and goats) reports.

8. Epidemiology of Foodborne Infections Group (ACM/1353)

8.1 The Chair invited Dr Paul Cook to present paper ACM/1353 which summarised the main items from the Epidemiology of Foodborne Infections Group meeting held on 13 January 2021. Dr Cook mentioned that his report is a summary of trends in animal and human infection, *Salmonella* National Control Programme (NCP) results 2019 and 2020 (January – September 2020) and summary of foodborne outbreaks in 2020. He added a caveat about 2020 being an abnormal reporting year due to various aspects with respect to the Covid-19 pandemic.

8.2 Dr Cook reported that:

- Between January and September 2020, there were 684 reports of *Salmonella* from livestock, excluding chickens and turkeys, which is 27% higher than during January – September 2019 (538 reports) and higher than the equivalent period of 2018 (461 reports).

- Members noted the increase of *S. Typhimurium* in pigs despite reduction in submission was a concern. Also highlighted as a concern (by EFIG) was the increase in multi-drug resistant *S. 4,5,12:i-* variant of monophasic *Typhimurium* with resistance to 9 different antimicrobials spreading among different breeding companies. It was underlined that this situation needs close attention.
- An overview of the *Salmonella* NCP results for 2019 and 2020 (January – September 2020) showed that few broiler flocks with regulated serovars were identified in 2020, however, flocks with non-regulated serovars continued to increase; these were mostly feed-related serovars. Monophasic *Salmonella Typhimurium* associated with dust from pig farms was not a problem in 2019 or 2020 as it was in 2018 and also because industry has used *Salmonella* vaccines more widely.

8.3 Report of annual human infection data quarters 1-3, 2020 revealed:

- There were 4107 reports of non-typhoidal *Salmonella* in quarters 1-3 of 2020 in the UK, a decrease from the 7053 cases reported in quarters 1-3 of 2019. The decrease in reporting rate was seen across all nations.
- Reports of *S. Enteritidis* decreased in the UK in quarters 1-3 of 2020 in comparison with quarters 1-3 of 2019, with decreases in reporting rates in all nations. The reporting rate for *S. Typhimurium* decreased in 2020 in quarters 1-3 compared to 2019, with case numbers decreasing from 1340 in quarters 1-3 of 2019 to 1026 in the same period in 2020.
- The most commonly reported *Salmonella* serovar in the UK for quarters 1-3 of 2020 was *S. Enteritidis* in all four countries (making up 28% of all non-typhoidal *Salmonella* reports), with *S. Typhimurium* being the second most common (comprising 25% of all reports). The proportion of *S. Typhimurium* reports increased from the same period in 2019, in which 19% of all reports were *S. Typhimurium*. *S. Enteritidis* and *S. Typhimurium* combined comprise 53% of reported non-typhoidal *Salmonella* cases, an increase from the same period in 2019 (49%). The only other serovars all three nations report amongst their top ten most commonly reported serovars are *S. Infantis*, *S. Agona* and *S. Stanley*. These were reported by three of the four nations in their top ten most commonly reported serovars.
- The reporting rate for *Campylobacter* decreased in the UK from 97.8 per 100,000 population in quarters 1-3 of 2019 to 74.0 per 100,000 in quarters 1-3 of 2020. The decrease in 2020 was seen across all nations.
- Reports of *Listeria monocytogenes* infection have decreased in the UK from 122 cases in quarters 1-3 of 2019, to 89 cases in quarters 1-3 of 2020. This drop is attributed to a reduction in cases reported in England; increases in case reports were seen in Wales and Scotland, and there was no change in case reports in Northern Ireland compared to 2019.
- Reporting of STEC O157 cases in the UK has decreased from 540 in quarters 1-3 2019 to 451 in quarters 1-3 2020. Decreases in cases were reported by

England and Scotland, while increases were reported in Wales and Northern Ireland.

- *Cryptosporidium* spp. reporting in the UK decreased in quarters 1-3 of 2020 compared to the same period in 2019. The reporting rate decreased in all four nations.
- 32 foodborne outbreaks were reported to eFOSS in England and Wales and to Public Health Scotland and Public Health Agency Northern Ireland (in quarters 1-3 of 2020). The pathogen implicated in the largest number of outbreaks was *Salmonella* (15/32 outbreaks, 47%), followed by STEC (7/32 outbreaks, 22%). In quarters 1-3 of 2019, there were 39 foodborne outbreaks reported. The pathogen implicated in the greatest number of outbreaks for the same period in 2019 was norovirus (14/39).
- Other items EFIG considered include: Control of *Salmonella* in feed, Summary of foodborne outbreaks in 2020, *Campylobacter* spp trends in England, food surveillance in England (PHE's recent food studies), Impact of Covid-19 on food surveillance and Infectious Intestinal Disease (IID) COVID survey.

8.4 Members made the following comments:

- Paragraph 39 to 43 discussed PHE's study 72 (*Salmonella* in reformulated chicken and other products). A member mentioned that there have been outbreaks in the past (Australia) linked to breaded chicken products which has led to some companies in the UK and other countries deciding to pasteurize products that were breaded that appeared cooked. Products were pasteurized deliberately to minimize the risk of consumers under cooking. The FSA was asked if this is common practice.
- Members noted that some companies in Canada mitigate against risks of consumers under cooking by flash frying products such as breaded chicken.
- There was discussion on the validity of cooking instructions that accompany products (how up to date are they?). It was noted that all of industry's cooking instructions on food packaging are validated. The instructions go through a process (in-house or external independent body) where the recommended instructions are checked to ensure they get the right internal temperature which would always be 70 degrees for 2 mins or equivalent.
- Referring to a recent *E. coli* outbreak in relation to burgers, there was discussion that there will always be a risk of cross-contamination and under cooking of raw products. The difficulty in distinguishing whether some outbreaks are as a result of under cooking or cross-contamination was underlined.
- A member reiterated concern on the format used to present EFIG updates. The member remarked that the report should bring out key messages/issues the committee should be providing advice on. A request was also made for a

summary of the updates. Dr Cook commented that the secretariat have requested PHE and APHA to respond to the specific queries that have been raised on the human and animal infections data that members are requesting for change in the way they are presented.

- Echoing the above comments on the need for PHE and APHA to respond to the queries ACMSF has made, a member underlined the need to clearly understand the data in the time series covered in the report as this is a period of significant change in consumer behaviour in relation to food.
- On the query raised on the “First wave of the IID COVID survey” (paragraphs 44 to 46 of the update) that has similar questions to the IID research projects (IID 1 to 3), it was confirmed that the survey was not comparable to the IID studies but is being used to capture what was happening in relation to IID during the pandemic.
- Referring to the increase of *S. Typhimurium* in pigs, a member asked if there were implications of this increase on process hygiene in relation to abattoirs. Dr Cook indicated that FSA Operations will be contacted for any advice they may have on this point and APHA’s update at the June EFIG meeting should provide information on whether or not this trend is continuing. **ACTION.**

8.5 The Chair thanked Dr Cook for his update. He underlined the need for the queries raised on the EFIG updates to be addressed.

9. Committee update

Emerging Pathogens Working Group

9.1 Dr Dan Tucker reported that his group revisited (in January 2021) the opinion provided to the FSA on risk-based considerations associated with consumption of human placenta. Members noted that the summary paper that captured the group’s discussion was revised to clarify some terms used in the paper (ACM/1361 refers).

Antimicrobial Resistance and Surveillance Working Groups

9.2 The Chair updated members on the activities of the AMR and Surveillance Working Groups. Members noted that in March 2021 both groups commented on the FSA Survey of AMR in *C. jejuni* and *C. coli* and levels of *Campylobacter* contamination in fresh whole UK-produced chilled chickens at retail sale (non-major retailers). The Chair thanked members of these groups that commented on this report. It was mentioned that the FSA is considering their comments before the survey report is published.

Subgroup on regulated products

9.3 The Chair reminded members that a subgroup on regulated products was setup earlier in the year. This group will consider risk assessment matters relating to regulated products.

FSA Social Science study on food safety behaviour in kitchens (Advisory group supporting study)

9.4 Mr Alec Kyriakides updated members on the activities of the above group. He reported that the FSA Social Science team is funding research on food hygiene behaviours in the kitchen through the FSA's Advisory Committee for Social Science (ACSS). Working Group entitled the Advisory Group on Kitchen Life was established with members of the ACSS, independent experts, the research team and ACMSF (invited to provide specific microbiological advice). Members noted that Alec is representing ACMSF on the group.

9.5 The study is being led by the research firm Basis Social who, together with the University of Leeds, will analyse and explore food hygiene behaviours in 35 domestic and 35 catering kitchens across the UK. The outputs will inform behavioural interventions and risk assessment models at the FSA. It is an 18-month study comprising three phases.

- Phase 1 is a literature review with expert interviews to understand food hygiene knowledge, behaviours and interventions across households and food businesses.
- Phase 2 involves working with a technology company who will install motion sensitive cameras in kitchens and record food hygiene behaviours over a period of one week. This will then be followed up with interviews and other primary research approaches to understand influences on these behaviours.
- Phase 3 involves a period of analysis, reporting and the development of hypotheses for behavioural interventions to inform the Agency's risk assessment processes.

9.6 The Phase 1 literature and expert review has been completed and reviewed at a recent workshop to assess the key findings and how this might influence the design of the study. The study is planned to focus on behaviours relating to the key food safety measures including cooking, cooling and cross-contamination. Key challenges for the research include how to capture suitable quantitative evidence in an observational study for elements such as compliance to shelf lives and also how to assess the impact of different kitchen behaviours e.g. consequences for foodborne disease. It is envisaged that some microbiological sampling will be incorporated into the study to provide some quantitative data. The committee will be kept abreast of developments from the research as this progresses over the next 18 months.

10. Dates of future meetings (ACM/1354)

10.1 Members were reminded of meeting dates in 2021 (24 June and 21 October) and 2022 (27 January, 23 June and 20 October). A member asked the secretariat when will the committee return to having face to face plenary meetings. It was confirmed return to face-to-face meetings for plenary and subgroup meetings will depend on government's rules as lockdown eased.

11. Any other business

11.1 The Chair drew members attention to the circulated information papers. He advised any member who has queries on expenses to wait after the meeting (after the end of the closed session) to chat with Azuka Aghadiuno.

12. Public Questions and Answers

12.1 Kaarin Goodburn commented on the breaded chicken study. She questioned why chicken from a source known to have production problems are allowed to be imported to the UK from the EU. She reported that it was common knowledge referring to the EU's Rapid Alert System for Food and Feed that there were issues with Polish produced chicken. Members noted that two strains of *Salmonella* Enteritidis in frozen, raw, breaded chicken products from Poland have caused almost 500 illnesses since January 2020 and at least one death in the UK. She enquired on what actions the UK and EU would take on this problem that is not going away. She raised if the UK could consider introducing testing requirements or erect barriers to mitigate against exposing UK consumers to unsafe chicken. She mentioned a similar problem in the mid-2000s when eggs contaminated with *Salmonella* from Spain brought about over 6000 illnesses. Prof Mumford (on behalf of the FSA) responded that there were ongoing discussions with the EU on how to address this issue of poultry products safety.

13. Update on Horizon Scanning workshop (ACM/1355) Reserved business

13.1 The Chair reminded members that following the horizon scanning output paper presented at the last plenary meeting, the secretariat agreed to provide an update on how the FSA has responded to the committee's comments. He acknowledged the presence at the meeting of FSA officials who contributed to producing paper ACM/1355 (Update on horizon scanning).

13.2 Dr Manisha Upadhyay was invited to introduce paper ACM/1355. She reported that the committee made a number of recommendations and requests for information at the workshop and explained that this update which covered Covid-19 related issues, Update on post-EU transition issues, UK-EU Trade and co-operation agreement, Cleaning and disinfection and *Salmonella* Enteritidis and Lion code eggs was the first of ongoing updates the committee will be receiving on the horizon scanning output.

13.3 Members discussed this item in close session.

**14.FS 101013 Campylobacter source attribution (Oxford study) (ACM/1356)
Reserved business**

14.1 Professors Noel McCarthy and Martin Maiden gave a presentation on the above study (Enhanced molecular surveillance of *Campylobacter* in Sentinel Sites in the UK). This FSA funded project was launched in 2015 to investigate human *Campylobacter* infections in rural and urban populations and provide a model which could link *Campylobacter* strains to principle food and animal sources, thus mapping the sources of human infection. Data was also sought to aid evaluation of the effectiveness of interventions to tackle *Campylobacter* in the food chain.

14.2 Members discussed this item in close session.

Annex 1
List of observers

Name	Organisation
Roy Betts	Campden BRI
David Lindars	British Meat Processors Association
Kaarin Goodburn	Chilled Foods Association
Rick Pendrous	Technology Writers
Samantha Kirk	Tesco
Eric Samuels	Europe Pall
Elizabeth Andoh-Kesson	British Retail Consortium
Diana Axby	Provision Trade Federation
Svetlozora Chobanova	FSS
Karen Pearson	FSS
Jacob Hargreaves	FSS
Anthony Wilson	FSA MRA
Bobby Kainth	FSA MRA
Victoria Cohen	FSA MRA
Katy Rosser	FSA MRA
Erin Lewis	FSA MRA
Ian Wood	FSA Policy
Nadeem Raja	FSA Policy
David Mortimer	FSA Policy
David Alexander	FSA Policy