MINUTES OF THE MEETING OF THE ADVISORY COMMITTEE ON THE MICROBIOLOGICAL SAFETY OF FOOD (ACMSF) HELD VIA MICROSOFT TEAMS ON 22 OCTOBER 2020 (NINETY-SEVENTH MEETING)

Present

Chair: Prof Bill Keevil

Members:
Dr Gary Barker
Dr Roy Betts
Dr Rohini Manuel
Dr Gauri Godbole
Prof Peter McClure
Mr Alec Kyriakides
Dr Dan Tucker
Mr David Nuttall
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 CSA: Prof Robin May (agenda items 1- 5 only)
FSA Science Council: Prof Jonathan Wastling

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

Presenters: Dr Iulia Gherman
Dr Marianne James

Members of the public: see Annex 1.

1. Chair's introduction

1.1 The Chair welcomed members of the committee (Dr Nicol Janecko was welcomed to her first plenary meeting) and members of the public to the 97th meeting of the ACMSF. He also welcomed Prof Robin May (Food Standards Agency, Chief

Scientific Adviser appointed in July 2020), Dr Iulia Gherman (FSA, Microbiological Risk Assessment, Science, Evidence and Research Division) who presented agenda item 7 (Review of the ACMSF report on vacuum packaging and associated processes), Dr Marianne James (Food Standards Scotland, Food Protection Science and Surveillance, Head of Microbiological Risk) who presented agenda item 9 (STEC Research in Scotland) and Prof Jonathan Wastling (FSA Science Council member) paired with ACMSF.

1.2 At the start of the meeting Prof May introduced himself to the Committee and explained his role. He gave a huge thank you to the members for their work. Prior to his appointment he was Director of the Institute of Microbiology and Infections at the University of Birmingham (he has retained his academic position at the University). Prof May indicated that he looked forward to working with the Committee collectively and on an individual basis. He explained that during his tenure as Chief Scientific Adviser he would like to improve visibility of FSA Scientific Advisory Committees and have very joined up SACs across government. He underlined that his vision is to have a more centralised visibility of all SACs so that SAC expertise won't just sit in one department. His wish is for SAC expertise to be available across government UK-wide. Members noted that Prof Patrick Vallance shares this vision. Prof May encouraged members to share with him any issues that may need wider visibility across government should there be the need for this.

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 and Dr Betts declared that Campden BRI (his employer) have been involved in projects on vacuum and modified atmosphere packed chilled foods. They also do testing of products in relation to STEC. Prof Butler declared that he currently has a national funded project by the Ministry of Agriculture in the Republic of Ireland on STEC.

4. Minutes of the 96th meeting

4.1 A member commented that the discussion on the Committee's Terms of reference was not clear on the conclusion reached. The Secretariat pointed out that the last bullet point in that section of the minutes (paragraph 6.2) stated that the Chair and Deputy Chair felt no amendment needed on the Terms of Reference. The secretariat agreed to make clear in the minutes that no changes will be made to the terms of reference in line with the comments made by the committee's Chair and Deputy Chair. The secretariat confirmed that Defra was added to the terms of reference paper (ACM/1321) as one of the departments ACMSF collaborates with.
Action: Secretariat

4.2 A member suggested an amendment to the final sentence in paragraph 7.4 (It is recognised that this advice does not extend to predictive modelling, which only considers growth, therefore the subgroup advises that modelling be conducted with expert advice). Suggested amendment will be sent to secretariat.
Action: Secretariat

4.3 Once the above amendments had been made the minutes would be regarded as an accurate record of the 96th meeting and posted on the ACMSF website.
Action: Secretariat

5. Matters arising

5.1 Paper ACM/1337 provided a summary of actions on matters arising from previous meetings. Dr Paul Cook reported that:

- Minutes of the 95th meeting have been posted on the website.

- 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. This will be circulated to members when it is available.

- Areas of Research Interest: The committee as requested reviewed and commented on the FSA areas of research interest and research questions formulated by the Chief Scientific Advisor's team. Members considered the questions in relation to the R&D needs in the area of microbiological safety of food.

- Update on the activities of the Epidemiology of Foodborne Infections Group (EFIG): *Campylobacter* infections in Wales and the reasons for the rise in the number of cases. Update recently provided to EFIG has corrected this query (paper ACM/1340 refers).

- Proposed Horizon Scanning Workshop: The workshop was held in June 2020.

- Members comments on the difficulty of being able to carry out risk assessment on the issue of the impact of plant protection products MRL rules on microbiological food safety have been passed to the FSA. It was noted that a meeting is being planned for the QACs and biocides subgroup to review any current issues. The FSA and Health and Safety Executive (regulator for the plant protection products rules) have representatives on the group.

- Literature review on botulism in cattle, sheep and goats: 2006 to 2019 to be revised to reflect comments made by members (work in progress). Revised report is expected to be presented at next plenary meeting.

- 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.

6. ACMSF horizon scanning workshop 2020 summary of discussions and outputs (ACM/1338)

6.1 The Committee held a virtual horizon scanning workshop in June 2020. The Chair invited Dr Manisha Upadhyay to introduce paper ACM/1338 that outlined the outputs from the workshop that followed a similar format to previous workshops with a mixture of breakout groups and plenary sessions. Dr Upadhyay explained that because the workshop was held in closed session it was the norm to provide an update in open session due to the Committee's commitment to openness and transparency. At the workshop, members identified emerging issues around a series of specific questions and agreed a prioritised list of recommendations that could be seen to have the greatest impact on reducing foodborne illness. Dr Upadhyay's report covered the priority emerging issues identified by members and the suggested possible actions. The specific questions to members were:

Q1- Can you identify any emerging issues that might present a risk to the public (COVID-19 related)?

Q2: Can you identify any emerging issues that might present a risk to the public (non-COVID-19 related)?

Q3: Are there any risks or opportunities associated with new food technologies not already considered by the ACMSF?

Q4: What do you view may be the main emerging issues, risks and opportunities following UK exit from the EU?

Q5: Is there anything else risk assessment related to bring to the FSA's attention?

6.2 Members were asked to note the outputs from the horizon scanning workshop and to indicate whether they were content to accept paper ACM/1338 as an accurate reflection of the horizon scanning workshop or whether there were any final amendments to make or additional points to consider. Members were given the option to provide further comments electronically after the meeting.

6.3 Members welcomed the output of the workshop as presented in paper ACM/1338. It was agreed that the paper accurately reflected the discussion the Committee had at the workshop.

6.4 A member congratulated Dr Upadhyay and her team for running a successful workshop underlining that the output has been very well captured in the circulated paper. However, she asked for the next steps after the paper is published. She enquired on the possible timeline for the proposed actions. Dr Upadhyay confirmed that the FSA's newly developed risk analysis framework for all Scientific Advisory Committees will guide how the recommendations in the paper are progressed. The

Secretariat will meet with the relevant teams in the FSA that are the policy lead for the areas identified as priority issues to discuss how they might be progressed.

6.5 Supporting the above remarks on the fruitful discussion the Committee had, another member cautioned on the pace in following up on the highlighted actions. He stressed the need for rapid consideration of the priority recommendations particularly the themes identified in relation to Covid-19. It was noted that not all the identified themes require urgent attention as a number of them can fall under the umbrella of a longer-term review. The Secretariat agreed to provide a progress report at the next plenary meeting. **Action: Secretariat**

7 Review of the ACMSF report on vacuum packaging and associated processes (ACM1339)

7.1 The Committee approved the publication of its subgroup's report on non-proteolytic *C. botulinum* and vacuum and modified atmosphere packaged food at the January 2020 plenary meeting. One of the key recommendation's was to review the Committee's 1992 report on "Vacuum Packaging and Associated Processes". Dr Iulia Gherman was invited to present paper ACM/1339 that asked members to discuss the above recommendation and identify priority areas that a review should cover. Dr Gherman reported that the 1992 report was the initial evidence base for the FSA's guidance on vacuum packaged (VP) and modified atmosphere packaged (MAP) chilled foods. The FSA's guidance fixed the maximum shelf life of these products to ten days, unless there are other controlling factors in place. This FSA guidance was revised in 2017 to improve clarity, with the evidence base remaining the same.

7.2 It was highlighted that the subgroup on non-proteolytic *Clostridium botulinum* and VP/MAP foods reviewed evidence provided by the British Meat Processors' Association and Meat Livestock Australia on the shelf life of beef, pork and lamb with respect to *C. botulinum* risk. The group concluded that there was evidence that the shelf life of VP/MAP fresh beef, pork and lamb could be extended to thirteen days, and that the ACMSF should consider reviewing the 1992 report. It was noted that the subgroup discussed elements of the 1992 ACMSF report during the course of its work although it was outside of the scope of the subgroup to review the document in full.

7.3 Members were informed that FSA Policy recently established a working group with industry representation to discuss updating the FSA guidance on VP/MAP foods. This working group is conducting an international review of legislation and guidance related to VP/MAP chilled fresh beef, lamb and pork, to determine whether the UK is unique in having specific guidance for such VP/MAP fresh meat. The FSA has also launched a consultation on its guidance.

7.4 Dr Gherman stated that given the time that has passed since the publication of the 1992 ACMSF report, the additional scientific evidence available and the introduction of new technology for VP and MAP foods, it was important to review the evidence on VP and MAP processes as recommended by the committee's subgroup. Members were invited to discuss risk assessment issues that are relevant for inclusion in a review of VP and associated processes. Dr Gherman mentioned that a proposal to set up an ACMSF subgroup to carry out the review will require a statement from

FSA Policy, which will set out the issues of interest to them. This is currently being considered.

7.5 Members were invited to comment on the following specific questions from the FSA:

- Consider what topics are likely to be of importance in a review of vacuum packaged foods and other associated processes, including the processes, types of food and the microorganisms of concern.
- Identify the priority issues for a future working group to address.
- Comment on areas that should not be covered in this review.
- Provide some initial suggestion as to how the work might be addressed from a risk assessment perspective and where additional evidence might be needed to support this work.

7.6 The following comments were made by members:

- Observing that there is presently no hazard analysis and critical control points flow chart to highlight the critical control points for the production process for vacuum and modified atmosphere packaged foods, a member suggested that the group that will be setup to review the 1992 report should consider designing a complete HACCP flow chart that will look at the potential risk at the critical control points of the production process. The critical points should be earmarked for risk assessment as this would be useful for risk managers to understand the relative risk at the critical control points.

- Highlighting that the approach taken by the authors of the 1992 report was to look at risk associated with vacuum and modified atmosphere packaged foods, a member felt the committee should consider putting more emphasis on the organism. Focussing the assessment on the risk of **botulism** from refrigerated vacuum packed and modified atmosphere packed food would emphasise the need to examine the risk associated with the organism and the product rather than the production process. It was explained that the committee/subgroup should avoid framing the assessment from a process perspective but seek to consider the risk assessment in a structured way such as looking at the disease, evidence of botulism from non-proteolytic *C. botulinum*, levels that cause disease, risk factors and foods associated with this organism etc.

- The above point was underlined by another member stating that looking specifically at the organism within the food group should be the way forward rather than looking generally at the food group. He also commented that other species of *Clostridium* known to produce botulinum toxin should be included in the review not restricting the risk assessment to *C. botulinum*.

- Supporting the suggestion that the focus of the review should be *Clostridium* species known to produce toxins, a member added that if the group looks at other pathogens it should use risk ranking in shortlisting the organism to assess.

- There was caution that any review of the 1992 report should not reinvent the wheel on the evidence base for the rules governing the production of vacuum and modified atmosphere products as the original guidance based on the 1992 report has worked well for food business operators. It was underlined that the review should recognise the volume of foods that are subject to the FSA guidance on the prevention of hazard from VP and MAP foods and be mindful of the implications of the outcome of the proposed review.

- Echoing the above point on the usefulness of the 1992 report, members noted that report has been very accessible to food enforcement officers when advising small and big food business operators. The flexibility it provides big business was emphasised.

- Appreciating the need not to reinvent the wheel, a member commented that as technologies have changed since the publication of the 1992 report, assessing the impact of these technologies in controlling pathogens would be relevant for the review. Also mentioned for consideration were plastics and the different packaging materials currently used for VP and MAP packed foods. The issue of whether these materials were conducive to biofilms and other risk factors was raised.

- Concerning the point on new technologies presently used for producing VP and MAP products, members were reminded that the subgroup on non-proteolytic *C. botulinum* and vacuum and modified atmosphere packaged food considered this in the course of producing their report. This point was specifically raised with the BMPA when they provided the subgroup with evidence. It was also mentioned that the subgroup was provided with robust up to date literature review to support the group's work.

- A member drew the Committee's attention to the distinction between VP and MAP processes used for foods as he felt the terms were being used interchangeably without distinguishing that these two processes were not the same. It was suggested that the review may want to consider using the terms "low oxygen and zero oxygen" packed foods in their deliberations. It was added that technology and producers of these foods have moved on since the publication of the 1992 report.

- As there is presently the movement away from nitrite/low nitrite in foods that traditionally had nitrites in them, it was suggested that the issue of nitrites in foods should be a key feature in the review. It was noted that the subgroup on non-proteolytic *C. botulinum* and vacuum and modified atmosphere packaged food did not have time to look at this area in detail.

- The review should consider the subject of "history of safe use" as several products that are affected by the current rules and possibly the proposed review will fall under this category.

- Review should revisit the issue of upper shelf-life limit for foods with controlling factors (the recommendation that the maximum shelf-life of foods given a heat process of 90ºC for ten minutes (or equivalent) should be limited to 42 days,

unless it can be shown that lysozyme is absent from the food). The member who raised this point felt re-examining the issue of lysozyme in foods was important as the recommendation in the subgroup's report (published in January 2020) could be mis-interpreted.

- Chapter 5 in the 1992 report should not be included in the review as it is risk management.

- It was highlighted that when the subgroup on non-proteolytic *C. botulinum* and vacuum and modified atmosphere packaged food considered BMPA's risk assessment of botulism from chilled, VP/MAP fresh meat held at 3°C to 8°C, it was noted that evidence in this area was sparse. There was the suggestion for the FSA and probably in collaboration with other funders consider funding research in this area to provide further evidence to inform risk assessment.

- A key output from the proposed review/risk assessment should be an estimate of risk comparative to risks from other foodborne pathogens that consumers are exposed to in food. It was added that controls for non-proteolytic *C. botulinum* in food appear to be placed at a level that is not commensurate with the risk it presents. The ACMSF's recently published report on multidimensional representation of risks was mentioned as a tool that may help address this point.

- ACMSF Scientific Secretary raised the issue of whether any ambient foods/products should be considered in the proposed review. Following discussion, it was agreed that this was too broad and an entirely different subject to be included in the review. However, it was agreed that the need to consider this area could be mentioned in the appendix of the report produced by the proposed subgroup.

7.7 In conclusion the Committee chair thanked members for their comments on the proposed review of the 1992 report on "Vacuum Packaging and Associated Processes".

8 Epidemiology of Foodborne Infections Group (ACM/1340)

8.1 The Chair invited Dr Paul Cook to present paper ACM/1340 which summarised the main items from the Epidemiology of Foodborne Infections Group meeting held on 6 October 2020. 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 – June 2020) and information on surveillance activities from England and Scotland. Members were informed that EFIG has been reflecting on the comments the Committee made on the need to improve updates provided at plenary meetings. It was stated other pressures have delayed EFIG's response to ACMSF.

8.2 Dr Cook reported that:

8.3 Between January and December 2019, there were 1161 reports of *Salmonella* from livestock, which is 7% higher than during January – December 2018 (1090 reports) and 4% higher than during the equivalent period of 2017 (1116 reports).

8.4 Reports of *S.* Typhimurium fell by 6% compared with January – December 2018 (111 vs. 118 reports) but increased slightly compared with the equivalent period of 2017 (115 reports). The most common phage types were DT193 (25 reports; 23% of total *S*. Typhimurium reports), DT104 (19 reports; 17% of total *S*. Typhimurium reports) and U288 (16 reports; 15% of total S. Typhimurium reports).

8.5 Between January and June 2020, there were 417 reports of *Salmonella* from livestock, which is 22% lower than during January – June 2019 (538 reports) and 10% lower than during the equivalent period of 2018 (461 reports).

8.6 Reports of *S.* Typhimurium were almost identical to January – June 2019 (51 vs. 52 reports) but 11% higher than the equivalent period of 2018 (46 reports). The most common phage types were U288 (17 reports; 33% of total *S*. Typhimurium reports), DT193 (13 reports; 25% of total *S*. Typhimurium reports) and DT104 (10 reports; 20% of total S. Typhimurium reports).

8.7 An overview of the *Salmonella* NCP results showed 4-layer flocks with *Salmonella* Enteritidis (SE) so far in 2020 compared to 16 in 2019. Three of the 4 SE flocks were identified by risk-based sampling of flocks with links to premises identified in 2019 and whole genome sequencing (WGS) of the isolates have shown that they are in the same cluster.

8.8 There have been fewer broiler flocks with regulated serovars so far this year (2: Jan -June 2020; 17 Jan-Dec 2019). However, flocks with non-regulated serovars continue to increase (1084: Jan- June 2020; 1455: Jan-Dec 2019). These are largely feed-related serovars and this is probably due to the EU ban on the use of formaldehyde in feed early in 2018 and that industry have not improved controls to reduce cross-contamination of feed after processing.

8.9 Trends in human infection data for 2019 revealed:

- There were 9,723 reports of non-typhoidal *Salmonella* in the UK in 2019, a decrease on the 10,298 reported in 2018, decreasing the overall UK reporting rate from 15.5 in 2018 to 14.6 in 2019. A decrease in the reporting rate was seen in England and Northern Ireland, the reporting rate in Scotland remained the same and an increase was seen in Wales.

- Reports of *S.* Enteritidis decreased in the UK in 2019 compared to 2018; with a decrease of 131 cases. Decreases were seen in England and Wales and increases were seen in Scotland and Northern Ireland. The UK reporting rate decreased from 4.7 to 4.4 cases per 100,000 population.

- A decrease in the reporting rate of *S.* Typhimurium was seen in 2019 compared to 2018 with a decrease of 375 cases. A decrease in reporting rate was seen in England, Wales and Scotland while the reporting rate remained the same in Northern Ireland.

- *S.* Enteritidis was the most commonly reported serovar across all constituent countries, comprising 31% of all reported *Salmonella* cases in the UK. Scotland

reported a slightly larger proportion of *S.* Enteritidis cases compared to all *Salmonella* spp. reported (40%), compared to 23% in Wales, 30% in England and 38% in Northern Ireland. *S.* Typhimurium comprises 18% of all reported *Salmonella* cases in the UK, with proportions within constituent countries ranging from 12% in Wales to 21% in Northern Ireland. Together *S.* Enteritidis and *S.* Typhimurium constitute 49% of all non-typhoidal Salmonellae reported in the United Kingdom.

- The reporting rate for *Campylobacter* in the UK in 2019 of 99.8 per 100,000 was similar to that reported in 2018 of 99.0 per 100,000. The rate of reported *Campylobacter* infections in England and Wales has increased for a third year in a row. The rate decreased in Scotland in 2019. Northern Ireland continues to report rates lower than the rest of the United Kingdom (71.7 cases per 100,000 population).

- Reports of STEC O157 in the UK decreased from a rate of 1.3 cases per 100,000 population in 2018 to 1.1 cases per 100,000 population in 2019. Decreases were reported across all four countries. Serotype O26 is usually the most commonly reported non-O157 serogroup in the UK and was the most common in England and Northern Ireland in 2019 with 127 reports.

- In 2019, 57 foodborne outbreaks were reported in the UK compared to 49 reported in 2018. There were 1,440 affected individuals, 989 of which were laboratory confirmed, and 84 reported hospitalisations. There were 15 reported deaths, two associated with *Salmonella* outbreaks, one associated with a VTEC O157 outbreak and 12 with three *Listeria monocytogenes* outbreaks. Norovirus was the most commonly reported causative pathogen (16/57 reported outbreaks, 28%) followed by *Salmonella* (15/57, 26%). The majority of foodborne outbreaks occurred in the food service sector (31/57, 54%), followed by community (18/57, 32%).

8.10 Other items EFIG considered include: food surveillance in England and Scotland, impact of COVID-19 on the food chain and food surveillance figures, FSA antimicrobial activities in relation to the food chain and a presentation on the burden of gastrointestinal disease in Scotland (*Salmonella* linkage data).

8.11 Members made the following comments:

- As the update highlighted the increase in the cases of non-regulated serovars due to the EU ban on the use of formaldehyde in feed, a member raised whether the Committee could be proactive and assess the impact of this ban in relation to the risk of *Salmonella* in the food chain. Although Dr Cook stated that the Advisory Committee on Animal Feedingstuffs advises (the FSA) on the safety and use of animal feeds and feeding practices, he agreed to take this query to the relevant unit in the FSA for consideration and provide feedback.

- Remain concerned on the reporting of the animal and human infections data as it is not clear if there is any connection in the presented data and if the changes in the trends has any significance.

- There does not seem to be much information in the update provided on NCP results for 2019 and 2020 (January to June 2020). The *Salmonella* in Livestock Production in GB 2019 report (link to report was included in paper ACM/1338) provided detailed information on *Salmonella* particularly on *Salmonella* Enteritidis (the biggest cause of human illness) that cases doubled in 2019. Information in the report on isolations of the most common serovars in livestock and people in GB 2019 was very useful. Having updates on the association between animal and human infections is relevant for the Committee and EFIG to see.

- It is unclear why animal infections data cover Great Britain and human infections data is UK-wide (is there a reason for this this?). This makes it difficult to have a direct comparison on trends of infection between animals and humans in the 4 UK countries. It would be useful for the secretariat to share EFIG's terms of reference with the Committee as this may provide clarification. Dr Cook confirmed that the terms of reference will be provided. **Action.**

- Antibiotic-resistant *Campylobacter*, a member asked if there was available data of the poultry farms in the country where antibiotic-resistant *Campylobacter* were isolated (are there differences in the usage of antibiotics in the different farms in the country)? Dr Cook confirmed that the Veterinary Medicines Directorate collect data on antibiotics usage in the livestock sectors across the country which is published yearly via the UK Veterinary Antibiotic Resistance and Sales Surveillance Report. He underlined that recent reports have revealed substantial reduction of usage of antimicrobials in the production of food producing animals. Dr Cook agreed to check with VMD if have information on location of farms where antibiotic-resistant *Campylobacter* was available. **Action**. The member who raised this question remarked that it would be useful to have this information in relation to data being collected on erythromycin and ciprofloxacin resistance (antibiotics used to treat *Campylobacter* in humans).

- A member echoed the above statement on the significant reduction in the usage of antibiotics in food producing animals in all sectors. He commented on the ban concerning formaldehyde explaining that the ban by the EU was based on the safety of operators in feed mills not because of its use in feed for animals. He added that the alternatives to formaldehyde have not been as effective and are expensive.

- Defra representative commented that Animal and Health Plant Agency (APHA) in Weybridge were investigating/working on alternatives to formaldehyde. He agreed to share any relevant information with the Committee. **Action**. On the increase in the cases of *Salmonella* Enteritidis in 2019 (mentioned in the Salmonella in Livestock Report GB 2019), he informed members that this was due to a number of outbreaks that affected several holdings. Members noted that Public Health England (PHE) and APHA now routinely use whole genome sequencing in investigations and share resulting data on regulated serovars (*S.*Enteritidis and *S.*Typhimurium) to see if they matchup with human outbreaks.

- On the question raised on impact of Coronavirus and food processing plants, it was confirmed that as it was not a direct food safety issue, it was the responsibility of the Health and Safety Executive and PHE.

- A member expressed the difficulty he has in understanding the trends presented in EFIG updates. He explained not knowing the number of samples taken in any context made it was difficult to discern the trends in the respective years and draw meaningful conclusions. Dr Cook explained the challenge PHE and APHA face in how to present animal and human data in the format members will welcome. He indicated that there are ongoing discussions how to address the Committee's observations on data presented in EFIG reports.

8.12 The Chair thanked Dr Cook for his update.

9 STEC Research in Scotland (ACM/1341)

9.1 Dr Marianne James was invited to give a presentation on Shiga toxin-producing *E. coli* (STEC) research in Scotland. She reported that since Food Standards Scotland (FSS) was established in April 2015 understanding the transmission of STEC has been one of its research priorities. It was noted that Scotland has consistently had a high rate of STEC in the UK. Dr James's presentation covered the following areas:

- Clinical STEC infection (rate of reported STEC O157 infections in the UK)
- Scottish cases of STEC infection April 2000 – March 2018
- Notable recent outbreaks of STEC in Scotland
- FSS Research programme on STEC

  Theme 1 – Understanding the source
  - *E. coli* O157 super-shedding in cattle and mitigation of human risk

  Theme 2 – Understanding STEC risks in the food chain
  - Internalisation of STEC into plant tissue
  - Control of pathogens in the production of raw milk cheese
  - The risk of STEC contamination in wild venison
  - Survey of the microbiological quality of beef mince on retail sale in Scotland

  Theme 3 – Understanding the epidemiology of STEC in Scotland
  - The diversity of clinical non-O157 STEC
  - Molecular risk assessment of non-O157 infection
  - STEC: Estimating the burden of gastrointestinal infection in Scotland using data linkage
- Evidence gaps
- Issues for industry and regulators

9.2 The Committee was invited to comment and propose any further evidence and information gaps for consideration for funding further research.

9.3 The following comments were made:

- Excellent presentation with interesting data that has filled some of the gaps on STEC.

- Impressed with the approach employed to investigate the diversity of clinical non-O157 STEC via the sequencing of archived isolates and carrying out molecular risk assessment supported by categorisation as proposed by the joint FAO/WHO expert group on STEC.

- Referring to the phrase pathogenic potential used in relation to the above study, a member flagged the term “zoonotic potential” and probed whether FSS was following the route of using machine learning techniques turning molecular techniques into a pathogenic response. It was noted that the Roslin Institute was looking at this for FSS in relation to pathogenic potential in humans rather zoonotic potential.

- Consider looking at pork and pork products as they may be an unrecognised risk. Particularly test for non-O157 species as these were found in pork sausages and minced pork meat in a survey of these products in Canada.

- Fascinating data from the survey of GB farms. Did you calibrate it down to farms in the North of England and how these will compare to Scotland? It was noted that although some of this information was collected in confidence, FSS confirmed that they know the location of the farms should they need to carry out further research in particular areas.

- In terms of the highlighted projects members noted that the survey reports have data on regional differences.

- On the question of whether the studies collected data on cattle movement/cattle sales, it was confirmed that having this information would be useful in relation to data on genotype circulation.

- Did FSS look at AMR in circulation in relation to the different cohorts. Members noted that FSS had two studies that tested for AMR in non O157 STEC.

- Are there any plans to look at the third part of the One Health triangle (the environment) and its role in the spread of STEC in the food chain. Looking at its contribution in fresh produce. Members noted that studies at the Republic of Ireland has revealed the environment’s STEC contribution to the food chain. Dr James confirmed that FSS has no plan to include the environment in its surveillance programme as water is not in their remit. She indicated that FSS could consider collaborating with Scottish Environment in this area. The ACMSF member offered to provide relevant material on Republic of Ireland’s STEC environmental work FSS might find useful. **Action.**

- Regarding super-shedders and risk mitigation, FSS appears to be focussing on a vaccine which is great. Is the plan only to use the vaccine to control super-

shedders or were they thinking of other measures? Dr James confirmed that a multiple risk mitigation approaches was the sensible way forward for the control of STEC (super-shedders). It was confirmed that the vaccine mentioned in the presentation is for O157 only not for all of the STECs. FSS presently do not have a strategic plan on how to control all the STECs on farms.

- Has FSS got plans of how the vaccines will be used by farmers and will they pay for vaccination? Dr James confirmed that there is a lot of positivity among farmers on the development of this vaccine. A member shared that a commercial vaccine produced in North America (about 10 years ago?) did not get a good up take. The point of having strong economic drivers and a robust social science assessment before producing a vaccine was underlined.

- Defra representative commented that following a recent outbreak of *Salmonella* in Sheep a study is being designed to look at the prevalence of *Salmonella* in sheep in England and Wales (sampling cecal contents at abattoirs). He offered to check if study will cover *E.coli*. **Action**. He added that if *E.coli* is included in the study this will be another source of data for FSS.

- A member discussed the point of how *E.coli* has been used as an indicator for STEC over the years. He provided reasons why this should no longer be the case.

- Reference was made to a study in the United States where comparison of shedding levels was made looking at the effect of feeding cattle with grain in winter when they were in doors and feed on grass in summer when they were outdoors. It was suggested that diet and seasonal trends should be considered in surveys/studies in relation to STEC.

- Whole genome sequencing was acknowledged to be great but its effectiveness is related to the sampling isolation method. It was explained that selective mediums can influence the isolation process which can bring biases at the molecular analysis stage. It was noted that Scottish *E.coli* O157 reference laboratory was aware of this.

- A member referring a study (to be carried out by PHS) that will estimate the burden of clinical STEC and determine risk factors and clinical outcomes (STEC: Estimating the burden of gastrointestinal infection in Scotland using data linkage) asked whether FSS/PHS's way of understanding burden of disease compared with other large well known longitudinal studies such as the UK Infectious Intestinal Disease studies?

- Defra representative mentioned an APHA study that looked at the dynamics of *E.coli* in cattle herd and super-shedders. He offered to send copy of study report to FSS. **Action.**

9.4 In conclusion the Chair thanked Dr James for her excellent presentation. He added that the Committee was amenable to be updated on the findings of the ongoing studies when the reports are published.

10 Committee update

Microbiological risk assessments in relation to food incidents

10.1 Dr Gary Barker reported that he has succeeded Prof McDowell as the chair of the above group. He updated members on the activities of the group. Members noted the group (that reviews the FSA's risk assessments in relation to incidents) reviewed the following risk assessments published in June 2020 by the FSA:

- Risk assessment: coronavirus risk to UK consumers via shellfish and crops grown on land treated with sewage sludge
- Qualitative Risk Assessment: What is the risk of food or food contact materials and surfaces being a source or transmission route of SARS-CoV-2 for UK consumers?

10.2 The group in August/September 2020 reviewed a study on Survivability of Covid-19 under frozen conditions. Study that generated media interest was a preprint on work carried out by a group in Singapore demonstrating survival for up to 3 weeks of artificially inoculated Coronavirus on meat and fish. The group felt the study's methodology was poor and light on the scientific description of the work carried out. It was highlighted that the findings of the study had been rejected for publication.

10.3 A member commended the group for its contribution on the aforementioned risk assessments. Drawing attention to the risk assessment on food contact materials she questioned if the risk assessment could be made more accessible to consumers providing specific information on packaging consumers would appreciate.

10.4 She asked if there were plans for revisions/updates should new information come to light on packaging material and food in relation to Coronavirus. She added that consumers would benefit by having guidance that would be reassuring on food packaging during the pandemic. Dr Barker clarified that the risk assessment was produced by FSA and the group's role was to review and comment on it. He also explained that ACMSF's role was strictly limited to risk assessment and the group did not and should not stray into risk management such as producing consumer advice. Members noted that the risk assessment has informed risk management advice across government. Members were informed that nothing radical has happened in the literature since the publication of the risk assessment.

10.5 A member pointed out that there is a general expectation that this winter there will be less respiratory outbreaks because of measures taken to control coronavirus. She asked whether the FSA will consider carrying out a study on SARS-CoV-2 infections in bivalves molluscs during the winter period. Dr Cook stated that the FSA had plans to consider the impact of Covid-19 on foodborne disease generally because of the big behavioural changes associated with lockdown. He noted the suggestion which he said will be passed to the FSA for consideration.

Antimicrobial Resistance Working Group

10.6 The Chair updated members on the activities of the AMR Working Group that reviewed the following studies:

10.7 The FSA's report on survey of EU Harmonised Surveillance of antimicrobial resistance (AMR) in bacteria from Retail Meats (Year 5 – Beef and Pork, 2019). Reviewed in July 2020.

10.8 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.

10.9 A member asked to see the final report of AMR use in crops study. The Secretariat agreed to circulate this once the final report is available. **Action.**

Surveillance Working Group

10.10 Dr Roy Betts reported that in July 2020 his group commented on the FSA's Guidelines for Undertaking Analytical Surveys. These guidelines assist FSA staff in commissioning and conducting food analytical surveys. Members comments were used to update the guidelines that was last reviewed in 2014.

Ad Hoc Group on Quarternary ammonium compounds (QACs) and Biocides used in food processing

10.11 Dr Gary Barker (Chair of the above group) updated members on the work of his group. He reported that although the group has not had a meeting in 2020 there has been activity in Europe on residue levels in chlorate and QACs. Members noted that the issue of residue level for chlorate in food has stabilised as the EU in summer 2020 agreed a maximum residue level residue acceptable to the food industry. No foods are now subject to the default level.

10.12 Members also noted that the food industry were happy with the position regarding QACs MRLs as they are not moving in the direction of default MRLs with the exception of infant formula. There are ongoing discussions on what counts as processed food. Dr Barker acknowledged the role of the regulator (Health and Safety Executive) who are dialoguing with Food Business Operators (Food Biocides Industry Group) to reach acceptable arrangements on this issue of MRLs for substances used in food processing. It was highlighted that the setting of MRLs for substances used as disinfectants was an ongoing process.

11 Dates of future meetings

11.1 Members were reminded of meeting dates in 2021 (28 January, 24 June and 21 October 2021).

12 Any Other Business

12.1 A member drew the Committee's attention to paper ACM/1323 TBEV – draft risk assessment in relation to food that was considered at the January 2020 plenary meeting circulated as an information paper. PHE had requested the Secretariat to remove confidential information that was in the risk assessment. A member mentioned that although she was satisfied with the outcome of the discussion the Committee had on the paper, she would like the author of the risk assessment 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. She pointed out that this should reflected in the paper's summary statement/final remark. **Action.**

12.2 The Secretariat was also asked to draw the 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". **Action.**

13 Public Questions and Answers

13.1 Kaarin Goodburn made the following comments on the highlighted subjects:

13.2 Chlorate residues in food, QACs and Biocides: She reported that the Health and Safety Executive (the regulator for plant protection products) have been working with Food & Biocides Industry Group (FBIG) on compliance issues. FBIG earlier this year published information it had compiled for HSE on sources of chlorates in the food chain (primarily from hygiene biocides' usage) and what viable mitigations FBOs had implemented in key example food types.

13.3 Regarding quaternary ammonium compounds, the EC has paused on further MRL-setting work as levels being proposed could not accurately be determined owing to isomers complicating laboratory methodology, and recognition of the importance of QACs not only in food hygiene, but also in the control of SARS-CoV-2. However, Member States' sampling data would continue to be gathered, for later review. FBIG hopes that an approach similar to that agreed on chlorates will be taken, although the UK will not be around the negotiation table.

13.4 ACM/1347 Fresh produce SARS-CoV-2 Risk Assessment does not reflect actual practice: This document did not take into account that the use of sewage sludge was banned in relation to all RTE crops commercially in 1999, through the ADAS Safe Sludge Matrix, to which all water companies and major retailers (and their suppliers) signed up and have maintained ever since as a core requirement. However, the risk assessment assumed usage in strawberry production, which is incorrect and although not materially impacting on the overall risk assessed in this case, it could have, and it impacted on the level of uncertainty reported. It would be most appropriate to reflect actual practices if in such cases where standard/best risk management practice is being considered by the FSA's risk assessment team, that they contact the relevant industry body (i.e. the subject matter experts) to determine what procedures are,

instead of simply doing some form of literature-based review. Such a review would not, as happened in this case, necessarily pick up this information.

13.5 ACM/1339 Review of FSA's 2017 VP/MAP Guidance: The review of the 1992 original ACMSF report did not convey any of the substantial fundamental and applied research, best production practice development or guidance work done in the 28 years since its publication. This work has been referred to numerous times in the Committee, particularly since publication of FSA's guidance. It is notable that the UK is the only country which has such guidance, and that fresh meat was intentionally not referred to in previous guidance including that published by FSA in 2008 since its safe consumption was known of for many decades yet research had not been done at that point to determine what the factors were. Major publicly and privately funded projects have has since been done (e.g. SUSSLE AFM266, Barker et al (AEM Jan 2016), MLA/BMPA (2019), Peck et al (Food Micro 2020)) showing that fresh meat has the lowest spore loading of any food material, by several magnitudes, and coupled with standard abattoir, subsequent processing and handling measures (e.g. CODEX, 853/2004, industry standards) has assured safety internationally. No other country limits the shelf life of foods in this way, creating technical barriers to trade, food waste, and the moral issue of killing sentient beings for their meat yet disposing of it on an arbitrary basis.

13.6 David Lindars (British Meat Producers Association) echoed comments made by Kaarin Goodburn on the review of the ACMSF's 1992 report on vacuum packaging and associated processes and the point a Committee member made on how to approach the review of the report (paragraph 7.6 bullet 2 refers). Mr Lindars asked for clarification on the issue of vaccine mentioned in relation to super-shedders to mitigate against STEC questioned whether vaccinated animals would be eligible for export (how would the EU for example perceive STEC vaccinated cattle?). Mr Lindars was advised to raise this with the Defra/FSA Trade Team.

Annex 1

List of observers

Name	Organisation
David Lindars	British Meat Processors Association
Kaarin Goodburn	Chilled Foods Association
Prof Mike Peck	QIB Extra
Rick Pendrous	Technology Writers
Nicola Wilson	Westward Lab
Gary McMahon	Moy Park
Samantha Kirk	Tesco
Bridgette Clarke	Bakkavor
Svetlozora Chobanova	FSS
Jacob Hargreaves	FSS
Victoria Cohen	FSA RAU
Katy Rosser	FSA RAU