ACM/MIN/95

MINUTES OF THE NINETY-FIFTH MEETING OF THE ADVISORY COMMITTEE ON THE MICROBIOLOGICAL SAFETY OF FOOD (ACMSF) HELD ON 17 OCTOBER 2019 AT 1.00PM AT THE FSA LONDON OFFICE, CLIVE HOUSE, 70 PETTY FRANCE LONDON SW1H 9EX

Present

Chair: Prof Bill Keevil

Members:
Prof David McDowell
Dr Bob Adak
Dr Gary Barker
Dr Roy Betts
Dr Gauri Godbole
Prof Peter McClure
Mr Alec Kyriakides
Dr Dan Tucker
Mr David Nuttall
Prof Miren Iturriza-Gómara
Dr Gwen Lowe
Miss Heather Lawson
Prof Francis Butler
Dr Wayne Anderson
Dr Edward Fox

Departmental representative: Dr Steve Wyllie (Defra)

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

Presenters: Dr Paul Gale
Dr Rachael Oakenfull
Dr Joanne Edge

Members of the public: see Annex 1.

1. Chair's introduction

1.1 Prof Bill Keevil chairing his first plenary meeting (he was appointed as ACMSF Chair in July 2019) introduced himself with a few words. He welcomed committee members and members of the public to the 95th meeting of the ACMSF (members too were invited to say a few words about themselves). The Chair also welcomed Dr Paul Gale, Animal and Plant Health Agency who would be presenting agenda item 7 (risk assessment for the use of *Mycobacterium* bovis BCG Danish Strain 1331 in cattle: risks to public health, Dr Rachael Oakenfull, Food Standards Agency:

Microbiological Risk Assessment who would be presenting agenda item 8 (Literature review on botulism in cattle, sheep and goats: 2006 to 2019) and Dr Joanne Edge FSA Risk Assessment Unit who would be presenting agenda item 13 (FSA and Food Standards Scotland Risk Analysis Guidelines). Item 13 was considered as reserved business.

2. Apologies for absence

2.1 Apologies for absence were received from Dr Jane Gibbens, Mrs Emma Hill, Mrs Ann Williams and Dr Rohini Manuel.

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. Drs Betts and Barker declared that they have carried out work on vacuum and modified atmosphere packed chilled foods funded by a variety of industry groups and Mr Kyriakides declared that his employer, Sainsburys, sold a number of products that could be discussed during the meeting. The Chair declared that his research group at University of Southampton has been carrying out work on biocides used in food processing for a number of years.

4. Minutes of the 94th meeting

4.1 Members approved the minutes of the 94th meeting as an accurate record and agreed that they should be posted on the ACMSF website.
Action: Secretariat

5. Matters arising

5.1 Paper ACM/1308 provided a summary of actions on matters arising from previous meetings. Dr Cook reported that:

- Members of the 93rd meeting has been posted on the website.

- The subgroup on non-proteolytic *Clostridium botulinum* and vacuum and modified atmosphere packaged foods has been established (group has had two face to face meetings with the next meeting scheduled for 28 November 2019).

- The Third report on *Campylobacter* (produced by the Ad Hoc Group) has been published. Members would be updated (under agenda item 9) on the prioritisation of the report's recommendations that the subgroup carried out for the FSA.

- Query on how the update on the activities of the Epidemiology of Foodborne Infections Group (EFIG) is presented to the Committee has been passed to EFIG secretariat to consider.

- Members request for Public Health England (PHE) to consider adding raw pet food in the scope of its enhanced surveillance of listeriosis cases is being considered by PHE's surveillance and gastrointestinal bacterial refence unit.

6. Ad Hoc Group on Representation of Risks

6.1 The Committee at the June 2019 plenary meeting were updated on the activities of the above the group. As the group had produced a draft report, Dr Manisha Upadhyay was invited to provide the background to the setting up of the group. She reported that at a horizon scanning workshop in 2018, the Committee identified the need to develop a two-dimensional framework for use in risk assessments (considered by ACMSF) as that the current one-dimensional approach to risk assessment based on the probability of an adverse effect occurring (to estimate the level of risk) did not always support clear decision making and communication. Members were reminded that this proposed risk assessment framework was welcomed at the June 2019 plenary meeting. Dr Upadhyay explained that the group's approach has been a 5-step procedure using a default qualitative approach to estimating risk, based on the likelihood of an adverse effect occurring, the impact of that effect and a more meaningful consideration of uncertainty beyond data uncertainty. It was pointed out that the proposed framework (presented in ACM/1309 Appendix A) will be revised after the meeting to include the group's position on the use of Disability Adjusted Life Years (DALYs) as an indicator of detriment.

6.2 Dr Upadhyay informed members of comments submitted by a member who was unable to attend the meeting. The member questioned the new approach's assessment of uncertainty pointing out the possible risks of contradictions. The member also made suggestions for the qualitative scale of frequency. Dr Upadhyay mentioned that Dr Gary Barker, Chair of the Group will address these queries.

6.3 Before introducing the proposed framework, Dr Barker, talked about the current one-dimensional approach where frequency is the sole indicator of risk (he highlighted the drawbacks of this approach). He outlined the 5 steps in the proposed two-dimensional risk assessment framework:

- Assign the assessment of the frequency of occurrence for an adverse event to one of six exclusive and exhaustive categories for frequency (Negligible, Very Low, Low, Medium, High, Very High)
- Assign the assessment of the severity of the detriment for an adverse event to one of four exclusive and exhaustive categories of severity (Negligible, Low, Medium, High)
- Assign the statistical uncertainty associated with the assessment of the frequency of occurrence to one of three exclusive and exhaustive categories of uncertainty (Low, Medium, High) and identify the exposed population that underlies the frequency assessment.
- In a remark assign the statistical uncertainty associated with the assessment of the detriment to one of three exclusive and exhaustive categories of uncertainty (Low, Medium, High) and identify variabilities in the populations

that underlie the assessment of severity of detriment (particularly the populations of exposed individuals and harmful agents).
- In a remark address the level of confidence, doubt and caution surrounding the science that underlies the assessment of risk.

6.4 Dr Barker explained that this framework that separates frequency of occurrence (which has six category scales) and severity of detriment (that has four category scales) is increasingly becoming popular in the risk assessment arena. These assessments also have three remarks that cover: uncertainty in occurrence, uncertainty in detriment and deeper uncertainty. He reported that the subgroup proposed a qualitative framework because of the variety of expertise on ACMSF. Dr Barker highlighted that the variation in expertise means this is the only universal framework that the experts on the Committee have in common. Members noted that this approach has indicative quantitative scales that can be used alongside each of the qualitative scales representing frequency and detriment.

6.5 The Committee noted that the subgroup agreed to adopt DALYs (instead of QALYs: the quality-adjusted life year) for this framework as this appears to be widely used in recent reviews/publications in the assessment of the burden of foodborne disease. Dr Barker explained that he was aware that the FSA's Economics Team have a preference for expressing burden of foodborne disease in QALYs. The subgroup's approach would be clearly stated in the report but it will be acknowledged that in the assessment of the UK population burden of food borne illness, the FSA adopts the closely related QALY scale to quantify detriments.

6.6 Members noted that separation of frequency and detriment would be beneficial to ACMSF in the event of complex risk assessments that the Committee may be asked to consider in the future.

6.7 In response to the aforementioned comments (from the member who could not attend the meeting), Dr Barker provided clarification. For the comment relating to apparent contradiction in the expression of uncertainty made by remarks 1 and 3 in the framework case study, remarks 1 and 3 refer to different kinds of uncertainty. Remark 1 estimates the uncertainty associated with the assessment of the frequency of occurrence and remark 3 is an additional step to address deeper uncertainty or unknown unknowns. The suggestion to attach an indication of actual time scale to the qualitative scale of frequency was turned down as it was felt there were no universal scales that can be used for these categories. The categories are purely indicative and "fuzzy" and it would be misleading to use them by default.

6.8 Dr Barker thanked members of the Ad Hoc Group for their contributions in drafting the report highlighting the significant contribution of the co-opted members of the group (Mr John Bassett and Dr Emma Snary).

6.9 The following comments were made by members on the framework:

- Excellent report: support the suggested qualitative approach.

- A member queried paragraph 17 (last sentence)*:* "The upper boundary of the category representing negligible risk is consistent with a 'safe' condition, a probability of 10^{-8} per event, that is widely accepted in consideration of foodborne botulism. He suggested this should be 10^{-12}". Following discussion, it was confirmed that although 10^{-12} is a recognised figure in relation to foodborne *Clostridium botulinum* kill, analysis of this in several studies has moved majority opinion to conclude that a 10^{-8}-10^{-9} probability of growth approximates to the 12-log inactivation of proteolytic *C. botulinum* in phosphate buffer (as described in the original study by Esty and Meyer, J Infect Dis., vol 31, pp. 650-663, 1922), and is an acceptable food safety objective. It was suggested that this point should be clarified in the report as a lot of people are familiar with 10^{-12}.

- On the question of whether ACMSF should simultaneously carry out quantitative risk assessment with the preferred default qualitative approach to estimating risk, there was no objection to this taking place if good quality evidence was available to carry out quantitative risk estimation. It was noted that if there was strong quantitative evidence the expectation is for the outcome to be consistent with the qualitative risk estimation. However, it was emphasised that ACMSF's default risk estimation should be the qualitative approach.

6.10 In conclusion as the question to members was whether they were content for this approach (two-dimensional qualitative approach) be adopted by ACMSF when reviewing and preparing all future risk assessments, members unanimously endorsed the new approach.

7. Risk assessment for the use of *Mycobacterium bovis* BCG Danish Strain 1331 in cattle: Risks to public health

7.1 In June 2015, the Committee was asked to comment on a risk assessment prepared by the Animal and Plant Health Agency (APHA) that assessed the risks to public health from the possibility of Cattle BCG vaccine being present in the food chain and in particular, milk and beef products. Members discussion on the risk assessment raised a few queries for APHA to consider which included the following:

- Is the strain of Cattle BCG being assessed a standard human BCG organism or is it cattle adapted? Members also asked for information on what dose is given to cattle and how this compares to a standard human dose.
- Is oral ingestion the only potential route of transmission of Cattle BCG or could handling/preparation of meat from vaccinated animals also play a role in transmission via the cutaneous or ocular routes?
- The risk estimate should be recalculated using alternative scenarios such as pasteurisation failures.

7.2 As APHA had considered the queries raised by ACMSF, Dr Paul Gale (APHA) gave a presentation to members seeking to address the Committee's queries. Regarding query 1, it was noted that the strain of CattleBCG is Danish strain 1331 which is an attenuated strain of *Mycobacterium bovis*. This is used extensively as a vaccine in humans against disease caused by pathogenic *Mycobacterium tuberculosis* complex organisms (mainly *M. tuberculosis*, but also others such as *M. africanum* or *M. bovis*). The dose given to cattle is within a range of 1-4 × 10^6 colony forming units (cfu) and a standard human dose is within the range of 2-8 × 10^5 cfu. As a result when compared to the HumanBCG dose, the dose in cattle is only 5-fold higher on average.

7.3 Query 2: the risk of illness in humans through the cutaneous and ocular routes via the handling/preparing of raw meat or raw milk from cattle vaccinated with CattleBCG. Dr Gale stated that APHA calculated risks to consumers handling/preparing raw beef and raw milk. The risk through inhalation was also considered. It was mentioned that the main difficulty in addressing query 2 was the lack of dose-response data for CattleBCG infection through the cutaneous, ocular and inhalation routes. The approach had access to limited data in the literature for *M. bovis*/*M. tuberculosis* infection in humans and converted to CattleBCG by applying an attenuation factor. The concentrations of CattleBCG in meat and raw milk estimated previously were used to calculate exposures to humans through the cutaneous and ocular routes, assuming that 1% of persons handling milk or meat had a skin abrasion or cut through which 0.01 cm^3 of liquid entered.

7.4 The highest predicted risk is through inhalation of meat juice. For inhalation of meat juice, combining the probabilities of each exposure scenario occurring, the risks of disease per meat handling event were assessed to be negligible. Overall, the risks from raw meat juices are orders of magnitude higher than for raw milk reflecting the higher predicted concentrations of CattleBCG in the meat juice compared to milk. For raw milk across all three exposure routes, namely cutaneous, ocular and inhalation, the risk of disease was estimated to be negligible. The risks from inhalation were predicted to be higher than those for the ocular and cutaneous routes, although there is uncertainty in this conclusion. The risks previously predicted for the oral route through consumption of minced beef and raw milk were estimated to be higher than those predicted here for the ocular, cutaneous and inhalation routes.

7.5 In alternative scenarios for the third query, the risks through consumption of pasteurised milk allowing for a 1% failure of pasteurisation, was assessed to be negligible.

7.6 The following comments were made by members:

- Clarification was requested on the three raw meat juice exposure scenarios (query 2). Dr Gale explained that 3 scenarios (3 to 5) revealed where the maximum BCG concentration was detected in positive cattle muscle at the injection site 21 days post injection. Max concentration observed was 3116 cfu/cm^3.

- As ACMSF had adopted (in its earlier discussion) the two-dimensional qualitative approach to risk estimation, a member suggested using this new framework on this revised risk assessment on the use of *M.bovis* BCG Danish strain 1331 in cattle.
- Members discussed the point in the response to query 3 relating to pasteurisation of milk (the risks through consumption of pasteurised milk allowing for a 1% failure of pasteurisation are negligible (99% is inactivated reducing risks from raw milk by 100-fold). It was remarked that although this may possibly be an over estimation, this statement could be misinterpreted. Following discussion, it was suggested that as issues relating to consumption of raw milk were sensitive any statement relating to unpasteurised milk should be properly referenced. Members noted the point made on STEC outbreaks (in the 1990s) associated with dairy farms and how these were linked to pasteurisation failure.

- On the request for evidence that in the event of pasteurisation failure consumers would be exposed to unpasteurised milk homogenously mixed with pasteurised milk, it was confirmed that dilution does not alter the risk of pasteurisation failures.

- Clarification was provided on the observation made on the following sentence in the report's abstract "Thus compared to the HumanBCG dose, the dose in cattle is only 5-fold higher on average". The query word "only" will stay in the report.

- A member cautioned on how the answers to the Committees' questions may be interpreted as the responses highlighting that there is negligible risk to public health due to cattle being injected with the BCG vaccine may be misleading (suggesting that vaccination should not be portrayed as a risk). It was stated that as the Committee are in support of vaccination of cattle against infections the risk assessment should be very clear that vaccination is not a risk but beneficial to animals and humans. It was also pointed out that as the strain of Cattle BCG Danish strain 1331 is an attenuated strain, if the Committee are comfortable with humans being injected with vaccine strains of up 10^8, it was irrelevant to calculate the risk in relation to consumption of cattle that has been injected with the cattle BCG vaccine.

- A member praised APHA for including the inhalation route in the risk assessment and commended the clarity and accessibility of the report.

7.7 Members endorsed the revised risk assessment as it was agreed APHA had satisfactorily addressed the three queries put to them in June 2015. It was agreed that as members were happy with these responses the earlier suggestion whether to try the newly adopted risk estimation framework on this revised risk assessment was unnecessary.

8. Literature review on botulism in cattle, sheep and goats: 2006 to 2019

8.1 At the request of FSA risk managers, the Committee was asked to revisit the issue of botulism in cattle, sheep and goats to identify any new information since the Committee's 2006 and 2009 reports. To do this, the FSA carried out a systematic literature review. Dr Rachael Oakenfull was invited to introduce the literature review (paper ACM/1311). The review covered the following areas:

- *Clostridium botulinum* the organism;
- Diagnosis and epidemiology of botulism in animals.
- The link between poultry waste and botulism outbreaks in cattle, sheep and goats.
- Contamination of food products through the transfer of spores, toxins or bacteria from groups of animals with botulism or suspected botulism.
- The associated risk to public health from food products derived from these animals.

8.2 Dr Oakenfull reported that the review question was split into five sub questions which followed the topics of the 2006 and 2009 reports to allow ease of comparison. Key developments identified include:

- The introduction of *C. botulinum* vaccinations for cattle in the UK.
- The improvement of laboratory-based diagnosis methods.
- Asymptomatic cattle may be carriers of *C. botulinum*.
- Further updates to the link between poultry and animal cases of botulism.

8.3 The Committee was specifically asked:

- To comment on the findings of the literature review.
- Consider whether the advice on voluntary restrictions to cattle, sheep and goats, and the potential risk to human health, is still supported.

8.4 The following comments were made:

- Some of the values and translations from the papers used for the literature review are not correct (e.g. inaccurate pH mentioned in paper). There is concern about the interpretation of data from studies cited in the literature review. For example, information in the literature review relating to asymptomatic carriers should be verified (it is not new that cattle and goats carry spores of botulism). Critical information relating to the various studies cited in the review should be clearly expressed in the report's conclusions.

- It was noted that the description given to table 13 (non C and D toxin types described in the literature) in the report is incorrect.

- Although the review identified cases of healthy cattle being asymptomatic carriers of botulism, it was noted that there were no recent cases of botulism

in humans that can be attributed to the drinking of raw milk or pasteurised milk. It was remarked that although the findings of the review may be interesting, public health professionals were not seeing cases of botulism ascribed to asymptomatic infection with C*. botulinum*. It was added that the increasing consumption of raw drinking milk may possibly have an effect on the number of future cases of botulism in humans.

- With the requirement to vaccinate livestock since 2006, members attributed the absence of human cases to the effectiveness of vaccination.

- A member who was in the subgroup that produced the 2006 and 2009 reports informed the Committee that the focus of the ad hoc group that produced both reports was the potential for transmission of the toxin to cattle and goats via poultry litter. The group in its conclusion viewed it as negligible that the toxin could be transferred to human from animals. It was suggested that the emphasis of this review should be on the toxin as opposed to the organism.

- Referring to the places in the review that new methodology was used, it was suggested that would be good to separate these out into the methods that detect toxin and methods that detect the organism.

- Table 1: amend the wording to more accurately describe the incidence of types C and D toxin causing illness in humans.

- Review made reference to human toxin types found in cattle in Germany. Dr Oakenfull was asked to indicate that these findings were in Germany not the UK.

- A member queried the use of fussy English (such as occasionally) and Figures in the review. He suggested the use of precise terms.

- Figure 1: reported botulism/suspected botulism incidents in the UK between 2008 and 2018, a member asked if there were any background data on previous incidents particularly when incidents peaked and when they started to drop and which subset of species human or animal were reductions observed.

- Although the Committee commended the structure of the report, Dr Oakenfull was asked to reflect on the points that came out of the discussions and revise the report as appropriate. **Action: Dr Oakenfull.**

- A member volunteered to send suggestions on the areas in the report that needs correction.

8.5 In conclusion, the Committee did not recommend a change to current advice which advises voluntary restrictions to cattle, sheep and goats and the potential risk to human health.

9. Committee updates

ACMSF subgroup on non-proteolytic *Clostridium botulinum* and vacuum and modified atmosphere packaged foods

9.1 Prof David McDowell (Chair of the above group) updated members on the activities of his group which was setup in June 2019. He reported that the group has had two face to face meetings. It was noted that the first meeting held on 31 July 2019 focussed on the group's terms of reference, scope of work and the group's work plan. At the second meeting held on 9 September 2019 the group agreed its terms of reference, received a presentation on an industry funded study (Risk Assessment of Botulism from Chilled, Vacuum Packed/Modified Atmosphere Packed Fresh Meat held at 3°C to 8°C, discussed available evidence on the subject of non-proteolytic *Clostridium botulinum* and vacuum and modified atmosphere packaged foods and revised their work plan. It was noted that the group has agreed to invite the Chilled Food Association (Kaarin Goodburn) to present the findings of the SUSSLE (enhancing sustainability in chilled prepared foods) project and any other relevant information to the group.

9.2 Members noted the group's agreed terms of reference:

- Review the Food Standards Agency guidelines for the shelf-life of vacuum and modified atmosphere packaged foods and the risk posed by non-proteolytic *C. botulinum*, and other pathogens where appropriate, from these foods. This group will consider the 1992 ACMSF *Report on Vacuum Packaging and Associated Processes*, but it is outside the scope of this group to review that document.
- Specifically review the industry funded risk assessment of botulism from chilled, VP/MAP (Vacuum Packed/Modified Atmosphere Packed) fresh meat held at 3°C to 8°C.
- Where appropriate consider other risk-related evidence relevant to this topic made available to the FSA and the ACMSF during the lifetime of the group.

ACMSF Ad Hoc Group on QACs and Biocides used in food processing

9.3 Dr Gary Barker (Chair of the above group) updated members on the activities of his group. He reported that the group has not met formally since the June 2019 plenary meeting. A teleconference is expected to take place in the coming weeks to decide the future direction of the group. Members were informed that:

QACs and Biocides

9.4 Further attempts to gather relevant evidence relating to food safety have been unsuccessful. Although there have been changes in disinfection and the use of biocides it has not been possible to source evidence that links these changes to changes in food microbiology. Dr Barker stated that although many organisations

disagree with the interaction of Plant Protection Product (PPP) regulations (EC Regulations 396/2005) with food safety considerations, the nature of the cross-over is outside the scope of the subgroup. He highlighted that UK monitoring data (from the Health and Safety Executive) for DDAC/BAC (didecyldimethylammonium chloride and benzalkonium chloride) is expected to be largely compliant with the current temporary MRL (0.1 mg/kg) and there is no evidence for PPP use. The EU process for consideration of the temporary MRL is ongoing.

Chlorate

9.5 The EU has not published any comments relating to the public consultation on Chlorate MRL that was concluded in February 2019 (submission from the subgroup and other UK organisations). The draft document that concerns changes in the MRL for Chlorate in food was considered at the European Commission's Standing Committee on Animals, Plants, Food and Feed meeting in September 2019 (the UK did not attend). There was a change to a footnote concerning the interpretation of monitoring results (possibly separating non-PPP sources) but it is not clear how this will impact on guidance. EU legislation regarding the new MRL is expected to be finalised later in 2019.

Ad Hoc Group on *Campylobacter*

9.6 Prof McDowell reported that the above group's report (Third report on *Campylobacter*) that was presented to the Committee at the June 2019 plenary meeting was published on 2 September 2019. As the FSA requested for the Ad Hoc group's assistance in the prioritisation of the report's recommendations, members noted that 13 high priority recommendations were identified by the group that were viewed to have the highest impact in terms of reducing foodborne illness. Members were informed that the secretariat will circulate these to the Committee for information **(Action: Secretariat).** Prof McDowell acknowledged the role Prof Sarah O'Brien who led the group in producing a comprehensive report which has been well received by the FSA. A member of the group echoed the role of Prof O'Brien in efficiently leading the group and shared his appreciation of the role of social science in understanding the barriers to change in the processes in the food supply chain. The Chair underlined the role of social science in risk assessment and congratulated the Ad Hoc Group for their authoritative report. He added that should this comprehensive report need updating in the future producing an annex may be a way to achieve this.

10. Dates of future meetings

10.1 Members were reminded of the future meeting dates in 2020. 30 January, 25 June and 22 October 2020.

11. Any Other Business

11.1 The Chair drew members attention to the information papers sent to them which included the committee's workplan (ACM/1314), update from other committees (ACM/1315), items of interest from the literature (ACM/1316), Third Report on Campylobacter (ACM/1317), FSA Board Paper: *Campylobacter* Reduction Programme (ACM/1318) and Progress update on AMR (ACM/1319).

11.2 A member referring to the *Campylobacte*r Reduction Programme (paper ACM/1318) discussed at the September 2019 FSA Board meeting asked for feedback (from Dr Cook) on how the discussion went as this was the first time the FSA Board discussed the increasing number of *Campylobacte*r in human cases. He asked if the FSA Board had any concerns. Dr Cook agreed to update the Committee at the next meeting plenary meeting as he did not attend the Board meeting. **Action: Secretariat**

12. Public Questions and Answers

12.1 Fiona Brookes (Fiona Brookes (Microbiology) Ltd) who did not hear Dr Cook's response to the question on the FSA *Campylobacte*r reduction programme asked Dr Cook to repeat his response. Dr Cook reiterated that as he did attend the Board meeting he will provide an update at the next ACMSF plenary meeting.

12.2 Kaarin Goodburn (Chilled Food Association) noted the update provided by the Chair of subgroup on QACs and Biocides used in food processing. She expanded the point made by Dr Barker on the outcome of the September 2019 meeting of the European Commission's Standing Committee on Animals, Plants, Food and Feed (the EC are in the process of deciding whether to extend the validity of the current temporary MRL (0.1 mg/kg) set for benzalkonium chloride and didecyldimethylammonium chloride). She underlined that QACs are the most effective hygiene biocides with respect to *Listeria monocytogenes.* On the point Dr Barker made on the unavailability of microbiological food safety data in relation to QACs/biocides, Kaarin Goodburn pointed out that there were lot of examples in the public domain that have shown that ineffective hygiene controls have led to the outbreak of foodborne infections such as botulism and STEC. Peter Littleton (Christeyns Food Hygiene UK) endorsed the points Kaarin Goodburn made regarding the dangers of further reduction in QACs MRLs. He explained that QACs and biocides play a key role in microbiological food safety and it was difficult to find alternatives to the existing effective products. The Chair indicated that the proposed reduction of QACs MRLs is a concern. He explained that as soon as you start reducing concentration of biocides or antibiotics you open the way for evolution/mutation of microorganisms and they can acquire resistance to the particular QAC and antibiotic.

13. Food Standards Agency and Food Standards Scotland Risk Analysis Guidelines

13.1 The Committee was updated by Dr Joanne Edge, (FSA) on the work being undertaken on risk analysis by the Food Standards Agency and Food Standards Scotland in preparation for the UK's exit from the EU.

14. *Salmonella* Enteritidis t5.2669 outbreak (update provided at the 17 October 2019 ACMSF meeting)

14.1 Information paper on the *Salmonella* Enteritidis t5.2669 outbreak was tabled to members at the meeting.

Annex 1

Observers to ACMSF meeting, 17 October 2019

Martin Briggs – FSA JEG member
Samantha Kirk - Tesco
Melanie Patterson – Neogen Culture Media
Dominic LeMare - Food and Drink Federation
Fiona Brooks – Fiona Brooks (Microbiology) Ltd
Kaarin Goodburn – Chilled Foods Association
Paul Davenport – Defra
Phil Hogarth – APHA
Steve Spencer – VMD
Amie Adkin – FSA RAU
Nicholas Daniel – FSA Analytics Team
Andrea Lozenzoni - EFSA
Elissavet Valanou – EFSA
Andrew Day - FSA
Thomas Rawson – FSA