Network on Microbiological Risk Assessment Minutes of the 18th meeting

Held on 24/25 April 2018, Parma

(Agreed on 31/05/2018)

Participants

- **Network Representatives of Member States (including EFTA Countries):**

Country	Name
Austria	Monika Matt
Belgium	Lieven De Zutter
Bulgaria	Hristo Najdenski
Cyprus	Christos Kourtis
Croatia	Brigita Hengl
Czech Republic	Barbora Mackova
Denmark	Maarten Nauta
Estonia	Mati Roasto
Finland	Jukka Ranta
France	Diane Cuzzucoli, Fredérique Audiat-Perrin
Germany	Anja Buschulte
Greece	Panagiota Gousia
Hungary	Arienn Berikcs
Ireland	Lisa O'Connor
Italy	Dario De Medici
Lithuania	Indre Stoskuviene
Netherlands	Aarieke de Jong
Poland	Elzbieta Mackiw
Portugal	Maria Manuela de Sol
Romania	Laurentiu Ciupescu
Slovakia	Lubomir Valik
Slovenia	Pavel Pollak
Spain	Elena CarrascoJimenez
Sweden	Jakob Ottoson
United Kingdom	Joanne Edge
Norway	Danica Grahek-Ogden
Switzerland	Francoise Fridez

- **EFSA:**

BIOCONTAM Unit: Pierre-Alexandra Beloeil, Frank Boelaert Sandra Correia, Teresa Da Silva Felicio, Michaela Hempen, Ernesto Liebana, Pietro Stella (chair).

SCER Unit: Caroline Merten

1. Welcome and apologies for absence

The Chair welcomed the participants. Apologies were received from Ireland and Portugal.

2. Adoption of agenda

The agenda was adopted without changes.

3. Agreement of the minutes of the 17th meeting of the Network on Microbiological Risk Assessment held on 10/11 October 2017, Parma[1].

The minutes were agreed by written procedure and published on 6 November 2017.

4. Topics for discussion

4.1. European Union summary report on trends and sources of zoonoses, zoonotic agents and food-borne outbreaks in 2016

EFSA presented the EFSA and ECDC report on the results of the zoonoses monitoring activities carried out in 2016. Campylobacteriosis was the most commonly reported zoonosis and the increasing European Union trend for confirmed human cases since 2008 stabilised during 2012–2016. The decreasing EU trend for confirmed human salmonellosis cases since 2008 ended during 2012–2016, and the proportion of human *Salmonella* Enteritidis cases increased. Most member states met their *Salmonella* reduction targets for poultry, except five MS for laying hens. At primary production level, the EU-level flock prevalence of target *Salmonella* serovars in breeding hens, broilers, breeding and fattening turkeys decreased or stabilised compared with previous years but the EU prevalence of *S.* Enteritidis in laying hens significantly increased. In foodstuffs, the EU-level *Salmonella* non-compliance for minced meat and meat preparations from poultry was low. The number of human listeriosis confirmed cases further increased in 2016, despite the fact that *Listeria* seldom exceeds the EU food safety limit in ready-to-eat foods. The decreasing EU trend for confirmed yersiniosis cases since 2008 stabilised during 2012–2016, and also the number of confirmed Shiga toxin-producing *Escherichia coli* (STEC) infections in humans was stable. In total, 4,786 food-borne outbreaks, including waterborne outbreaks, were reported. *Salmonella* was the most commonly detected causative agent – with one out of six outbreaks due to *S.* Enteritidis – followed by other bacteria, bacterial toxins and viruses. *Salmonella* in eggs continued to represent the highest risk agent/food combination. The full report is available on the EFSA website. [2]

[1] https://www.efsa.europa.eu/sites/default/files/event/171010-m.pdf

[2] https://efsa.onlinelibrary.wiley.com/doi/full/10.2903/j.efsa.2017.5077

The new BIOHAZ Panel mandate on *Salmonella* control in poultry flocks and its public health impact[3] was introduced.

4.2. *Salmonella* on pig carcasses in Belgian slaughterhouses

The Belgian representative presented a study that investigated the distribution of hygiene indicator bacteria and *Salmonella* on pig carcasses. *E. coli* and *Salmonella* presence ranged from 15% (elbow) to 89% (foreleg) and 5% (elbow) to 38% (foreleg), respectively. Positive relations were found between hygiene indicator counts and *Salmonella* presence at the head, sternum, loin and throat. *Salmonella* spp. were mostly detected in oral cavity swabs (n=15, 54%), of which six samples were contaminated in numbers over 2.0 log CFU/100 cm^2. *Salmonella* spp. were also recovered from 17 tonsillar tissue samples (18%) and 12 tonsillar swabs (13%). Out of the 29 rectal content samples from which *Salmonella* was recovered (31%), most were lowly contaminated, in the range between 1 and 0 log CFU/g. In two slaughterhouses, four *Salmonella* strains were inoculated onto pork skin to investigate differences in the recovery of *Salmonella* on pig carcasses using non-destructive and destructive sampling methods. Inoculated skin samples were sampled before and after chilling with two sampling methods: swabbing and destruction. The study concluded that swabbing after chilling leads to an underestimation of the real number of contaminated carcasses and that destructive sampling is the more designated sampling method after chilling. The study results are published in Biasino et al., 2018,[4] Van Damme et al., 2017,[5] and Vanantwerpen et al., 2016.[6]

4.3. French risk assessment activities on *Salmonella*

The French representative and guest speaker gave an overview of Anses risk assessment activities on *Salmonella*. Anses published two risk profiles: a data sheet on *Salmonella* spp.[7] and a technical and scientific support on risk assessment of *S.* Enteritidis and *S.* Typhimurium in "roped" poultry (whole poultry offals).[8] Anses further carried out a quantitative microbiological risk assessments (QMRA) on *S*. Dublin in raw milk cheese following a major outbreak of salmonellosis in older people linked to two cheeses made from unpasteurized milk in late 2015 and early 2016. A QMRA on *Salmonella* spp. in pigs (farm to consumption) is currently ongoing using also the model developed for the EFSA opinion on *Salmonella* in pigs (EFSA BIOHAZ Panel, 2010).[9] The mandate askes for a literature review and quantitative assessment of the efficacy of control measures at different stages of the pig production chain. Publication of the report is planned for June 2018. Anses is also providing technical and scientific

[3] http://registerofquestions.efsa.europa.eu/roqFrontend/questionLoader?question=EFSA-Q-2017-00692

[4] Biasino, W., De Zutter, L., Mattheus, W., Bertrand, S., Uyttendaele, M. and Van Damme, I., 2018. Correlation between slaughter practices and the distribution of Salmonella and hygiene indicator bacteria on pig carcasses during slaughter. Food microbiology, 70, pp.192-199.

[5] Van Damme, I., Mattheus, W., Bertrand, S. and De Zutter, L., 2017. Quantification of hygiene indicators and Salmonella in the tonsils, oral cavity and rectal content samples of pigs during slaughter. Food Microbiology.

[6] Vanantwerpen, G., De Zutter, L., Berkvens, D. and Houf, K., 2016. Impact of the sampling method and chilling on the Salmonella recovery from pig carcasses. International journal of food microbiology, 232, pp.22-25.

[7] https://www.anses.fr/en/content/microbiological-hazards-files

[8] https://www.anses.fr/fr/system/files/BIORISK2016SA0253Ra.pdf

[9] https://www.efsa.europa.eu/en/efsajournal/pub/1547

support for the French ministry of agriculture on technical aspects of sampling plan on *Salmonella* in infant formula.[10]

4.4. Occurrence of monophasic *Salmonella* Typhimurium in Estonian food chain and its relation with human salmonellosis cases

The Estonian representative gave an overview of salmonellosis in Estonia and the importance if monophasic *S.* Typhimurium. In 2016, Estonia observed two *Salmonella* outbreaks: one with 88 cases of *S.* Infantis, and another with 70 cases of *S.* Enteritidis. In 2017, there was one outbreak with 17 cases (*S.* Typhimurium) and another with 12 cases (monophasic *S.* Typhimurium). The aim of the study on monophasic *S.* Typhimurium was to determine patterns of antibiotic resistance and genetic similarity and to compare isolates from human, animal and food origin and identify sources of human infection. The study concluded that the occurrence of monophasic *S*. Typhimurium is increasing in Estonia and isolates showed a high rate of multiple resistances. Publication of results is in preparation.

4.5. RAKIP: the Risk Assessment modelling and Knowledge Integration Platform

The representative from Denmark introduced the network to RAKIP, the risk assessment modelling and knowledge integration platform, a collaborative project of BfR, Anses and DTU. The aim of the platform is to facilitate the re-use of models and thereby facilitate quick and high quality risk assessments.

The project has 1) defined terms, concepts and metadata requirements, 2) created and open web-based food safety knowledge repository[11] with a standardised software language and 3) uploaded models.[12]

RAKIP supports BfR in the EFSA-BfR Framework partnership agreement on building a QMRA model repository prototype that can be linked with EFSA's Knowledge Junction.

4.6. Quantitative microbiological analysis of artisan stretched cheese production

The Slovakian representative presented the results of a quantitative microbiological analysis of artisan stretched cheese production. Stretched cheese is a traditional Slovakian dairy product. The study looked at total bacteria count, yeasts and mould, coliform counts, *Escherichia coli* and *Staphylococcus aureus* and concluded that numbers of *E. coli* and *S. aureus* reduced during processing possibly due to lactic acid bacteria, low pH and stretching temperature.

4.7. Advisory report on alternatives for milk pasteurisation

The Dutch representative presented the Advisory report on alternatives for milk pasteurisation.[13] The Netherlands Food and Consumer Product Safety Authority was asked for an opinion on food safety risks of treating milk by high pressure

[10] https://www.anses.fr/fr/system/files/MIC-Ra-PoudresLaitEN.pdf

[11] https://foodrisklabs.bfr.bund.de/rakip-web-portal/

[12] Rodríguez, C.P., Haberbeck, L.U., Desvignes, V., Dalgaard, P., Sanaa, M., Nauta, M., Filter, M. and Guillier, L., 2017. Towards transparent and consistent exchange of knowledge for improved microbiological food safety. Current Opinion in Food Science.

[13] https://www.nvwa.nl/over-de-nvwa/documenten/risicobeoordeling/voedselveiligheid/archief/2017m/advies-van-buro-over-alternatieven-voor-pasteurisatie-van-melk

processing, or pascalisation, as an alternative for pasteurisation. The report concluded that there are no food safety risks if the process is properly designed.

4.8. EFSA's activities on Qualified presumption of safety (QPS)

The BIOHAZ secretariat presented EFSA's QPS activities and the scientific opinion on the update of the list of QPS-recommended biological agents intentionally added to food or feed as notified to EFSA.[14] In 2007, EFSA's Scientific Committee recommended that a Qualified Presumption of Safety (QPS) approach should be implemented across EFSA. This should apply equally to all safety considerations of biological agents that EFSA assesses. The Scientific Committee also set out the overall approach to follow and established the first list of proposed biological agents for QPS status.

The QPS list is reviewed by EFSA's Panel on Biological Hazards (BIOHAZ). New biological agents recommended for QPS status are regularly added to the 2016 QPS list through a Panel statement. The QPS approach can be used for pre-market safety assessment of notified biological agents by all EFSA's Scientific Units and Panels. The aim of QPS is to harmonise risk assessment and allow risk assessors to focus on the biological agents with the greatest risks or uncertainties.

4.9. European Union summary report on antimicrobial resistance in zoonotic and indicator bacteria from humans, animals and food in 2016

EFSA presented the EU summary report on antimicrobial resistance in zoonotic and indicator bacteria in 2016, published in February 2018.[15] In *Salmonella* from humans, the occurrence of resistance to ampicillin, sulfonamides and tetracyclines was high, whereas resistance to third-generation cephalosporins was low. In *Salmonella* and *E. coli* isolates from broilers, fattening turkeys and their meat, resistance to ampicillin, (fluoro)quinolones, tetracyclines and sulfonamides was frequently high, whereas resistance to third-generation cephalosporins was rare. The occurrence of ESBL-/AmpC producers was low in *Salmonella* and *E. coli* from poultry and in *Salmonella* from humans. The prevalence of ESBL-/AmpC-producing E. coli, assessed in poultry and its meat for the first time, showed marked variations among MSs. Fourteen presumptive carbapenemase-producing *E. coli* were detected from broilers and its meat in two MSs. Resistance to colistin was observed at low levels in *Salmonella* and *E. coli* from poultry and meat thereof and in *Salmonella* from humans. In *Campylobacter* from humans, broilers and broiler meat, resistance to ciprofloxacin and tetracyclines was high to extremely high, whereas resistance to erythromycin was low to moderate. Combined resistance to critically important antimicrobials in isolates from both humans and animals was generally uncommon, but very high to extremely high multidrug resistance levels were observed in certain *Salmonella* serovars. Specific serovars of *Salmonella* (notably Kentucky) from both humans and animals exhibited high-level resistance to ciprofloxacin, in addition to findings of ESBL.

The ECDC/EFSA/EMA second joint report on the integrated analysis of the consumption of antimicrobial agents and occurrence of antimicrobial resistance

[14] http://registerofquestions.efsa.europa.eu/roqFrontend/questionLoader?question=EFSA-Q-2016-00684

[15] https://www.efsa.europa.eu/en/efsajournal/pub/5182

in bacteria from humans and food-producing animals was also briefly presented. For details refer to the full report.[16]

The ECDC, EFSA and EMA Joint Scientific Opinion on a list of outcome indicators as regards surveillance of antimicrobial resistance and antimicrobial consumption in humans and food-producing animals[17] was published in September 2017 to support the EU efforts to reduce antimicrobial resistance.

4.10. Antimicrobial resistance in the UK food chain

The UK representative presented the report of the ACMSF "Task and finish" group on antimicrobial resistance in the food chain. The group's terms of reference focussed on identifying research questions and potential approaches which would (i) decrease uncertainty about any linkage between use of antimicrobials in food production, the incidence of antimicrobial resistance in pathogens and commensals in food production, and the growing AMR-related public health burden, and; (ii) allow to model the impacts of changes in use of antimicrobials in food production.

The group developed a food chain focussed AMR systems map taking into account a wider AMR systems map developed by other UK government departments in 2014. This map guided the discussions and activities of the group, and identified eight main reservoirs with a potential AMR impact relevant to food, which were subsequently reviewed within the group's report. The eight main reservoirs were identified as: pasture and crops, amendments, food producing animals, animal feed, abattoir & carcass processing, food processing, human food, humans.

The report drew a range of conclusions and contains a large number of recommendations, including areas where further research is required. In particular, the group derived a number of general conclusions and overarching themes including the need for more data on AMR in relation to; co-ordinated (One Health) regular, targeted surveillance of UK produced/processed and imported foods; AMR transfer between commensals and pathogens; the potential impact of Brexit; alternatives to antimicrobials; the AMR selective effects of feed/food processing actions and environments. A draft version of the report was published in January 2018[18] and the final version will be published in June 2018.

4.11. Dutch advisory report on exposure to ESBL-producing bacteria via meat

The Dutch representative presented the NVWA advisory report on exposure to ESBL-producing bacteria via meat.[19] The main exposure to ESBL-*E. coli* via meat and meat products is formed by products that do not undergo an adequate heating step before consumption. Bacteria with ESBL genes come from different sources and reach the human population along multiple routes, such as via

[16] https://www.efsa.europa.eu/en/efsajournal/pub/4872

[17] https://www.efsa.europa.eu/en/efsajournal/pub/5017

[18] https://acmsf.food.gov.uk/acmsfmeets/acmsfmeets/acmsf-meeting-25-january-2018/acmsf-agenda-25-january-2018

[19] https://www.nvwa.nl/over-de-nvwa/documenten/risicobeoordeling/voedselveiligheid/archief/2017m/advies-buro-esbl-besmetting-via-vlees

animal contact, livestock farmers and food preparers, the environment and food. When all possible routes are considered, it is not likely that unheated meat and meat products are the most important route of exposure of ESBL-producing *E. coli* (see also Dorado-Garcia et al., 2017).[20]

4.12. Belgian risk assessment of *Bacillus cereus* in rice cakes

The Belgian representative presented a risk assessment of *B. cereus* in rice cakes.[21] *B. cereus* is a hazard inherent to the raw materials of rice cakes, namely rice and raw milk. As the spores can survive the baking process, this pathogen constitutes a risk for the consumption of rice cakes. The original question concerned the risk after storage at ambient temperature during 12 hours. Growth parameters were calculated from the challenge test realized in the study project and growth simulations were realized with the aid of ComBase.[22] The food safety risk resulting of storing rice cakes at ambient temperature at the bakery during 12 hours is estimated to be low. It is also estimated to be low when the rice cakes are stored refrigerated afterwards.

The MRA network members discussed the validity of this result as the value for ambient temperature used in this risk assessment may not be representative for actual temperatures observed in a bakery during summer.

4.13. Risk factors for microbiological contamination of raw and minimally processed plant products

The Belgian representative presented an advice of the Scientific Committee of the Federal Agency for the Safety of the Food Chain on risk factors for microbiological contamination of raw and minimally processed plant products.[23] The advice concerned raw/fresh and minimally transformed vegetable foods, focussing on vegetables and fruits, fresh herbs and sprouts and included vegetables and fruits, fresh herbs and sprouts. The advice concluded that foodborne viruses, *Salmonella*, STEC and *Listeria monocytogenes* have the highest priority. Organic fertiliser and irrigation water are the most important risk factors. A criterion of 100 cfu/100 ml *E. coli* was recommended for irrigation and rinsing water instead of the current requirement of 10.000 cfu/100 ml *E. coli.* In addition, personal hygiene of staff handling the food is crucial.

4.14. EFSA's Guidance on Uncertainty Analysis in Scientific Assessments

EFSA presented its guidance on uncertainty in scientific assessments which offers a diverse toolbox of scientific methods and technical tools for uncertainty analysis. It is sufficiently flexible to be implemented in such diverse areas as plant pests, microbiological hazards and chemical substances. The approach is described in two separate documents: a short user-friendly guidance[24] with

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[20] Dorado-García, A., Smid, J.H., van Pelt, W., Bonten, M.J., Fluit, A.C., van den Bunt, G., Wagenaar, J.A., Hordijk, J., Dierikx, C.M., Veldman, K.T. and de Koeijer, A., 2017. Molecular relatedness of ESBL/AmpC-producing Escherichia coli from humans, animals, food and the environment: a pooled analysis. Journal of Antimicrobial Chemotherapy.

[21] http://www.favv-afsca.fgov.be/scientificcommittee/opinions/2017/_documents/Advice09-2017.pdf

[22] https://www.combase.cc/

[23] http://www.favv-afsca.fgov.be/wetenschappelijkcomite/adviezen/2017/_documents/Advies11-2017_SciCom2013-12_Groentenfruitmicrobiologie.pdf

[24] http://www.efsa.europa.eu/en/efsajournal/pub/5123

practical instructions and tips, and a supporting scientific opinion[25] with all the detailed scientific reasoning and methods. EFSA has launched an open consultation until 24 June 2018 to receive feedback on this draft approach to communicating uncertainty from practitioners, experts and officials who are involved in science communication and risk communication.[26]

4.15. Update on activities related to Hepatitis E virus in the Netherlands

The Dutch representative gave an update on the MSs activities related to Hepatitis E virus (HEV). NVWA conducted a study that looked at HEV in food products, in particular porcine blood products (Boxman et al., 2017).[27] HEV RNA was detected in 33/36 batches of (non-heated) liquid products and in 7/24 spray dried powder products. Another study investigated sources and risk factors for hepatitis E in Dutch blood donors (Mooij et al., 2018).[28] The overall IgG-seroprevalence was 31% (648/2100) and increased with age. Several food products were independently associated with IgG-seropositivity in a multivariate analysis adjusting for age and gender among 1562 participants who completed the questionnaire: traditional Dutch dry raw sausages called "cervelaat", "fijnkost", "salami" and "salametti" which are generally made from raw pork and beef, frequent consumption of bovine steak, and frequent consumption of smoked beef. Although not frequently reported, contact with contaminated water was also a risk factor for seropositivity. A case-control study aims at identifying acute hepatitis (Tulen et al., 2018, in preparation). Consumption of fermented dry raw pork sausages was reported by 72% of hepatitis E patients versus 46% among controls. Working with septic tanks and contact with pigs were also identified as risk factors. The use of diaphragm in dried/fermented sausages may also play a role in the transmission of HEV (Boxman et al., in preparation).

4.16. EFSA Opinion on development of microbiological criteria

The BIOHAZ secretariat presented the BIOHAZ panel opinion on the requirements for the development of microbiological criteria.[29] The role of risk assessors should be focused on assessing the impact of different microbiological criteria on public health and on product compliance. It is the task of the risk managers to: (1) formulate unambiguous questions, preferably in consultation with risk assessors, (2) decide on the establishment of a microbiological criterion, or target in primary production sectors, and to formulate the specific intended purpose for using such criteria, (3) consider the uncertainties in impact assessments on public health and on product compliance and (4) decide the point in the food chain where the microbiological criteria are intended to be applied and decide on the actions which should be taken in case of non-compliance. It is the task of the risk assessors to support risk managers to

[25] http://www.efsa.europa.eu/en/efsajournal/pub/5122

[26] http://www.efsa.europa.eu/en/consultations/call/180504

[27] Boxman, I.L., Jansen, C.C., Hägele, G., Zwartkruis-Nahuis, A., Cremer, J., Vennema, H. and Tijsma, A.S., 2017. Porcine blood used as ingredient in meat productions may serve as a vehicle for hepatitis E virus transmission. International journal of food microbiology, 257, pp.225-231.

[28] Mooij, S.H., Hogema, B.M., Tulen, A.D., van Pelt, W., Franz, E., Zaaijer, H.L., Molier, M. and Hofhuis, A., 2018. Risk factors for hepatitis E virus seropositivity in Dutch blood donors. BMC infectious diseases, 18(1), p.173.

[29] https://www.efsa.europa.eu/en/efsajournal/pub/5052

ensure that questions are formulated in a way that a precise answer can be given, if sufficient information is available, and to ensure clear and unambiguous answers, including the assessment of uncertainties, based on available scientific evidence.

4.17. Recent and ongoing mandates of BIOHAZ Panel

The BIOHAZ Panel adopted an opinion on joint ECDC, EFSA and EMA scientific opinion on a list of outcome indicators as regards surveillance of antimicrobial resistance and antimicrobial consumption in humans and food-producing animals (EFSA-Q-2016-00638) (was presented under 4.9).

Following up on the adopted opinion on Listeria monocytogenes in ready-to-eat (RTE) foods,[30] the outcome of the public consultation has been published[31] and the models made available on EFSA's Knowledge Junction.[32,33]

New mandates received are:

- Scientific opinion on the pathogenicity assessment of Shiga toxin-producing Escherichia coli (STEC) and the public health risk posed by contamination of food with STEC (EFSA-Q-2018-00293);[34]
- Scientific Opinion on the application and use of next generation sequencing (including whole genome sequencing) for risk assessment of foodborne microorganisms (EFSA-Q-2018-00058);[35]
- Scientific Opinion on *Salmonella* control in poultry flocks (EFSA-Q-2017-00692).[36]

5. Any Other Business

The network members expressed their concern about the reduction of the number of network meetings from two annual meetings to only one. This reduction results in fewer possibilities for networking and exchange of information. The network members encourage EFSA and network member organisations to find solutions that would allow a second meeting in 2018, e.g. as a virtual meeting or the member organisation covering the travel and accommodation cost of their representatives at the meeting. The chair promised to inform EFSA managers about this concern and the suggestions made and to look into possible solutions.

6. Date for next meeting

The next meeting will be held in spring 2019 in Parma.

7. Closure of the meeting

The chair thanked the participants and closed the meeting.

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30 http://www.efsa.europa.eu/en/efsajournal/pub/5134

31 http://www.efsa.europa.eu/en/supporting/pub/1352e

32 https://doi.org/10.5281/zenodo.1117638

33 https://doi.org/10.5281/zenodo.1117741

34 http://registerofquestions.efsa.europa.eu/roqFrontend/questionLoader?question=EFSA-Q-2018-00293

35 http://registerofquestions.efsa.europa.eu/roqFrontend/questionLoader?question=EFSA-Q-2018-00058

36 http://registerofquestions.efsa.europa.eu/roqFrontend/questionLoader?question=EFSA-Q-2017-00692