House of Lords EU Energy and Environment Sub-Committee: Brexit plant and animal biosecurity inquiry

Written evidence submitted by the Society *for* Applied Microbiology

Introduction and summary

1. The Society *for* Applied Microbiology (S*f*AM) welcomes the opportunity to respond to the Sub-Committee's inquiry into the impact of Brexit on the UK's plant and animal biosecurity.

2. Microorganisms such as bacteria, fungi and viruses have an enormous impact on the health of animal and plant life and the safety of food. These are global issues, reflected by the fact that microorganisms do not respect borders. Effectively tackling these issues therefore relies on the application of microbiological science through international cooperation. Microbiologists play a crucial role in detecting and understanding potentially dangerous microorganisms, with research in this area being used to inform containment and risk mitigation strategies at national and local levels, as well as rapid response to threats such as disease outbreaks.

3. Regarding Brexit, S*f*AM acknowledges that many fundamental issues for scientists are still uncertain, particularly the UK's future involvement in EU-wide research funding mechanisms and ensuring the flow of science talent to and from the UK continues unhindered.

4. While a swift resolution to these issues is desperately needed, the content of this document focuses on a few key recommendations relating to food safety and plant & animal health:

    4.1. The UK government should support continued collaboration between our National Reference Laboratories (NRLs) and the EU Reference Laboratory (EURL) Network, and ensure UK NRLs have the resource to conduct internationally-leading research.

    4.2. HM Government should commit to continued close collaboration and sharing of scientific expertise with the European Food Safety Authority (EFSA) and the European Centre for Disease Prevention and Control (ECDC), mirroring its previous dedication to the European Medicines Agency (EMA).

    4.3. Biological resource centres (BRCs) are an underused resource in the UK, which ought to be better utilised to access international data and samples of crucially important pests and pathogens (disease-causing microorganisms).

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What are the implications of the UK's withdrawal from the EU for the UK's biosecurity in terms of animal and plant health, invasive species and food safety?

Reference Laboratories

5. The UK National Reference Laboratories (NRLs) are responsible for developing reliable, standardised testing methods in the areas of feed & food and animal health.[1] Individual laboratories specialise in monitoring threats including avian influenza, foot and mouth disease, toxins in food and antibiotic drug resistance. Many other countries house their own NRLs, which perform similar functions.

6. The EU Reference Laboratory (EURL) network was established by the European Commission to ensure that EU regulations on food safety and health are implemented throughout the EU in a co-ordinated manner.[2] For each topic, one EU Member State NRL functions as the European lead (for example, the Pirbright Institute in the UK is the designated EURL for Bluetongue disease). Each EURL ensures that work in other Member State NRLs is harmonised, reducing the need for repeat testing of food and animals in each EU country. This is carried out through the development of standardised methods, materials, proficiency testing schemes and training for laboratory staff.

7. Seven UK NRLs currently function as designated EURLs.[3] These reference laboratories will lose EURL status when the UK withdraws from the EU, subsequently losing the funding support received from the European Commission.

    7.1. A number of EURLs in the UK also function as worldwide reference centres for the Food and Agriculture Organization of the United Nations (FAO) and the World Organisation for Animal Health (OIE).[4] Activities related to the FAO and OIE are not necessarily supported by additional funding, so in practice EU funding goes toward enabling this internationally relevant work.

    7.2. Withdrawal from the EU also risks UK NRLs being unable to participate in future EU-funded international research collaborations, such as the Horizon 2020 EU-China-Safe project, which aims to facilitate knowledge transfer between reference laboratories in the EU and China.[5]

8. If the UK continues to trade food and feed with the EU, we will need to demonstrate regulatory equivalence in terms of standards and safety. The UK's reference laboratories will therefore be required to operate much in the same way they do now.

    8.1. The EURL networks are open to non-EU countries, whose representatives may attend meetings and participate in group proficiency tests. Strong consideration should be given to this option for future UK-EU reference laboratory collaboration.

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[1] See https://www.food.gov.uk/enforcement/sampling/nrl for details on the UK NRLs responsible for food and feed.
[2] More information on EURLs can be found at https://ec.europa.eu/jrc/en/eurls
[3] EURLs based in the UK: avian influenza; bluetongue; crustacean diseases; foot and mouth disease; transmissible spongiform encephalopathies (e.g. BSE); viral and bacteriological contamination of bivalve molluscs.
[4] For more information, see http://www.oie.int/en/our-scientific-expertise/reference-laboratories/list-of-laboratories/ and http://www.fao.org/ag/againfo/partners/en/ref_centres.htm
[5] For more information see http://cordis.europa.eu/project/rcn/210500_en.html and https://www.fera.co.uk/eu

8.2. In the unlikely scenario that all collaboration between the EURL network and UK NRLs ceased, some NRLs would be required to develop their own reference materials and standards from scratch. The development and maintenance of these would place a significant demand on resources and capacity.

9. **The Society for Applied Microbiology recommends that HM Government make a strong commitment to maintain collaboration with the EURL network, and to provide additional support to UK NRLs to compensate for any loss in funding, or equivalent resource, as a result of losing EURL status.**

EU Agencies

10. UK-based scientists and experts play a significant role in informing and influencing the work of EU agencies, such as the European Food Safety Authority (EFSA), the European Centre for Disease Prevention and Control (ECDC) and the European Medicines Agency (EMA). Not only do these collaborations ensure that food safety and disease control activities across the EU are based on up-to-date scientific consensus, they also function as a conduit of soft power.

Example: UK experts and EFSA

11. A report of the 66th meeting of the EFSA Advisory Forum, in December 2017, indicates the level of UK involvement in EU-wide food safety activities.[6] Since the triggering of Article 50, EFSA has been taking stock of the UK's involvement and has prepared an "*Inventory of possible impacts of the UK withdrawal on the work of EFSA*".

    11.1. UK-based experts made up **13%** of the population of EFSA's Scientific Panels in the period of 2009-2018. In particular, between 2015 and 2018, **24%** of experts on the panels on Dietetic Products, Nutrition and Allergies (NDA), Biological Hazards (BIOHAZ) and Plant Health (PLH) were from the UK.

12. The UK regularly contributes a significant level of scientific and research expertise to EU agencies on threats of domestic and international importance. Important examples include:

    12.1. Coordinated responses to the 2011 outbreak of *E. coli* O104:H4 throughout Germany and other parts of Europe.[7] The outbreak, the deadliest in recent history, was caused by this rare drug-resistant strain of bacteria and required state-of-the-art genomic techniques to effectively trace to the source.

    12.2. In 2014, whole genome sequencing data from Public Health England was used to trace a Europe-wide outbreak of *Salmonella* infection to a single European egg producer.[8]

[6] https://www.efsa.europa.eu/sites/default/files/event/AF171205-p6_EFSA_PPT%20BREXIT.PDF
[7] For information on the 2011 outbreak of *E. coli* O104:H4 in Germany, see the Annual Report of the Chief Scientist 2011/12, Food Standards Agency, pg. 28.
[8] FAO (2016). Applications of Whole Genome Sequencing in food safety management

12.3. ECDC-organised laboratory networks, for example FWD-Net, which is responsible for long-term surveillance and monitoring of food- and waterborne-diseases and zoonoses (infectious diseases of animals that can be transmitted to humans).[9]

13. UK scientists also contribute to activities that are co-ordinated across the EMA, EFSA and ECDC. For example, one of our members provides scientific advice to cross-agency work on promoting the appropriate use of antibiotic drugs in animal husbandry. Post-Brexit, the UK should continue to have a meaningful input to such pan-agency activities.

14. HM Government's 'collaboration on science and innovation' paper indicates that "*the UK is fully committed to continuing the close working relationship*" with the European Medicines Agency (EMA).[10] This is welcome, as it will help ensure that any new drugs, including antibiotics, are fully tested before they are licensed for use in the UK. **However, it is deeply concerning that the paper does not contain a similar dedication towards collaborating with other EU agencies alongside the EMA, such as EFSA and ECDC.** It is imperative that HM Government maintains close links with all these agencies, and that UK-based scientists remain enabled to share their expertise to help mitigate biosecurity, health and food safety threats on our doorstep and beyond.

To what extent is a shared approach to biosecurity between the UK and the EU necessary and / or appropriate post-Brexit?

15. As mentioned above, if the UK intends to continue trade in food and feed with the EU, maintaining a shared regulatory approach would be sensible. To that end, continued participation of UK NRLs in EURL Network activities is not dependent on the UK being a member of the EU.

16. One of our members highlighted that some countries are reluctant to share biosecurity information, due to a fear that it will have a negative impact on trade (e.g. food). If the EU continues to be a significant trade partner post-Brexit (the UK government has previously stated its intentions to maintain this), the benefits of already having a shared, open approach to biosecurity should not be taken for granted.

Example: Monitoring antimicrobial drug resistance in agriculture

17. Infections that cannot be treated with conventional antibiotic drugs (caused by antimicrobial resistant microorganisms) pose a significant threat to the productivity of livestock farming and aquaculture.[11] Mitigating the danger of antimicrobial resistance (AMR) requires careful monitoring of veterinary drug use, alongside long-term surveillance of the spread of disease. The UK Veterinary Medicines Directorate (VMD) annually collects such information as part of the Veterinary Antimicrobial Resistance and Sales Surveillance (VARSS) programme.[12]

18. Currently, the UK reports data to EFSA and ECDC as part of the mandatory EU Harmonised Monitoring programme.[13] The threat of AMR is a serious global issue, so

[9] https://ecdc.europa.eu/en/about-us/partnerships-and-networks/disease-and-laboratory-networks
[10] Collaboration on science and innovation, HM Government, September 2017, para. 29
[11] O'Neill Review on Antimicrobial Resistance, pg. 24.
[12] https://www.gov.uk/government/publications/veterinary-antimicrobial-resistance-and-sales-surveillance-2016
[13] European Centre for Disease Prevention and Control (2016). EU protocol for harmonised monitoring of antimicrobial resistance in human Salmonella and Campylobacter isolates, pg. 2.

it is in the UK's interests to continue a shared approach to monitoring and surveillance with nearby European neighbours.

Are there alternative (i.e. non-EU, or international) mechanisms that the UK will be able to participate in post-Brexit?

19. The Global Microbial Identifier (GMI) is an initiative that aims to provide an internationally-accessible store of genomic information and epidemiological data, to facilitate the tracking of infectious and foodborne disease.[14] UK-based experts remain a key contributor to the GMI, representing 10% (23 out of 228) of members, second only to the US.

20. The GMI is still in development, however, and so is not suitable as a direct replacement for existing mechanisms. In addition, the initiative is currently focused on diseases of relevance to humans, and not plants or animals.

What are the main mechanisms for biosecurity information sharing between the UK and the rest of the EU? Can these be maintained post-Brexit?

Biological resource centres

21. Biological resource centres (BRCs) are curated physical repositories of organisms, many of which hold living specimens of pests and disease-causing microorganisms relevant to plant, animal and human health. BRCs work together to share information and best practice: the UK Biological Resource Centre Network (UKBRCN) is such a collaboration, comprising 14 major BRCs with access to over 150,000 different organisms.[15]

Example: National Collection of Plant Pathogenic Bacteria

22. The National Collection of Plant Pathogenic Bacteria (NCPPB) enables researchers in academia and industry to access 1000's of plant disease-causing organisms from around the globe.[16] The NCPPB also supplies reference bacterial strains to national plant protection organisations and offers services to rapidly identify unknown specimens. Collections such as these provide an infrastructure to underpin developing research into solutions for biosecurity threats and future sustainability.

23. BRCs do not participate in early warning systems such as the Rapid Alert System for Food and Feed (RASFF). However, some BRCs (or their host organisations) track and monitor the spread of organisms, and so provide up-to-date information relevant to plant and animal biosecurity.

[14] http://www.globalmicrobialidentifier.org/about-gmi
[15] https://www.phe-culturecollections.org.uk/news/culture-collection-news/uk-biological-resource-centre-network.aspx
[16] http://ncppb.fera.defra.gov.uk

Example: The CABI Plantwise initiative[17]

24. The Centre for Agriculture and Biosciences International (CABI) has developed the Plantwise Knowledge Bank, which monitors global occurrences of plant disease, with the goal of supporting farmers in developing countries. Interested parties can subscribe to the Knowledge Bank to receive geographical alerts on the spread of plant pests and diseases.

25. UK-based BRCs collaborate extensively with international partners, through organisations such as the European Culture Collections' Organisation (ECCO), the European and Mediterranean Plant Protection Organization (EPPO) and the World Federation for Culture Collections (WFCC).[18] These organisations provide forums for data sharing and exchange of knowledge, for example the Global Catalogue for Microorganisms, which connects data from 120 BRCs across 46 countries.[19]

26. ECCO and EPPO are independent of the EU, so Brexit should not hinder UK BRCs from having continued access to these networks.

    26.1. However, Brexit casts uncertainty over whether UK BRCs will be able to collaborate with the Microbial Resource Research Infrastructure (MIRRI), which is an established European Research Infrastructure Consortium (ERIC). Association with MIRRI would allow UK BRCs a deeper level of coordination and data sharing with BRCs across the EU.[20]

27. **Currently, BRCs are an underused resource in the UK**, and so offer an opportunity for the UK government to make better use of international networks that will remain after the UK withdraws from the EU.

    27.1. For example, the UKBRCN could receive more support to coordinate data sharing with industry and the Research Councils under UK Research and Innovation.

About the Society for Applied Microbiology

28. The Society *for* Applied Microbiology (S*f*AM) is the oldest microbiology society in the UK, representing a global scientific community that is passionate about the application of microbiology for the benefit of the public. Our Members work to address issues involving the environment, human and animal health, agriculture and industry.

    S*f*AM works in partnership with sister organizations and microbiological bodies towards enabling microbiologists to inform policymaking within the UK, in Europe and worldwide.

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[17] https://plantwise.org
[18] a) https://www.eccosite.org/; b) https://www.eppo.int/; c)http://www.wfcc.info/
[19] http://www.wdcm.org/index.html
[20] https://www.mirri.org/home.html