Advisory Committee on Releases to the Environment (ACRE)

Minutes of the 159th ACRE meeting held on 7 November 2023

The meeting was held online

Attendees

ACRE members:

Prof Jim Dunwell (Chair)
Dr Andy Wilcox
Prof Ben Raymond
Prof Peter Lund
Dr Kathy Bamford
Prof Huw D Jones
Dr Huw E Jones
Prof Andrew Millar

Assessors:

Sue Grogan-Johnson (HSE)
Beverley Boyce (HSE)
Chris Stockdale (FSA)
Rhys Williams (FSA)
Rachael Oakenfull (FSA)
Gerard Kerins (GMI)
James Blackburn (GMI)
Iain Williams (GMI)
Jessie O'Shaughnessy (SASA)
Laura Bowden (SASA)
Mark Preston (Northern Ireland)
John McKillen (Northern Ireland)
Emily Jones (Welsh Government)
Heather Campbell (Scottish Government)

Defra:

Martin Cannell (Secretary)
Rachel Davis
Sean Simpkins
Janet Talling
Oli Watson
Lucy Foster
Mike Ellis
Ivy Wellman
Richard Lloyd Mills

1. Actions and matters arising

The Secretariat confirmed that ACRE's comments on the three GMO veterinary medicine applications had been shared with the Veterinary Medicines Directorate, who had expressed their thanks to ACRE.

The Secretariat also confirmed that, as a result of ACRE's discussion at the previous meeting concerning four GMO food and feed import applications, each specific product had been added to the published table associated with the relevant generic advice.

2. Royal Society briefing paper (INF11)

The Secretariat gave a summary of a recently published report from the Royal Society: "Enabling genetic technologies for food security: a policy briefing". The report discusses the implications of the Genetic Technologies (Precision Breeding) Act relating to the regulation of Genetically Modified Organisms (GMOs) (referring to ACRE's guidance on determining qualifying higher plant status). It acknowledges i) the role GM crops could play in addressing food security and improving agricultural sustainability and ii) the importance of supporting a scientific approach to regulation. It outlines some of the risk assessment requirements for a GM crop to be placed on the market either for cultivation or food and feed use and cites previously published ACRE reports which are critical of the approach taken by the EU.

Committee members were broadly supportive of the report and felt that ACRE's previously published work, which covered the same or similar issues, was still very pertinent. Whilst there were no concerns that ACRE's work in this area needed revising, there was general agreement that it will be important to make sure the committee's views and advice remain based on the best available evidence.

New GM food and feed applications (P6)

The Secretariat summarised key information relating to six new applications for GMO food and feed imports – four maize, one soybean and one oilseed rape. These contained a range of transgenes enabling tolerance and resistance to various herbicides, maize lepidopteran and nematode pests, and one which encoded a bacterial thermostable alpha-amylase gene.

The Committee was content that, based on the evidence presented, no safety issues were present relating to the import and processing of these products. However, several points of clarification were discussed regarding the current scope of ACREs generic advice for imported/processed GMO food and feed products and the content of the post market environmental monitoring plans accompanying the environmental risk assessments.

1/ It was noted that ACRE's generic advice concerning herbicide tolerant oilseed rape is limited in scope to only those with tolerance to glufosinate ammonium and/or glyphosate herbicides. However, MON 94100, demonstrates tolerance to dicamba herbicide via a mode of action not previously assessed by ACRE (expression of the dicamba monooxygenase (DMO) enzyme from the bacterium *Stenotrophomonas maltophilia*). ACRE agreed to revise the generic advice for rapeseed so that its scope includes those

products with tolerance to dicamba herbicides. **Action.** Secretariat to engage with ACRE to take forward.

2/ It was noted that ACRE's generic advice covering crops with 'limited' and 'no' potential to grow under climatic conditions in England. This includes a consideration of the potential for horizontal transfer of genetic material between plant material and the soil microbiome, but not the potential for horizontal transfer of genetic material from consumed or eaten genetically modified food to humans, animals or other micro-organisms. **Action** for Secretariat to engage with ACRE and FSA to take forward.

3/ **Action:** The Secretariat to explore with the FSA an issue related to the Post Market Environmental Monitoring (PMEM) plans submitted alongside applications.

3. Risk assessment / risk management of synthetic gene-drive organisms (INF6)

The Secretariat introduced this information paper to raise awareness of current international discussions under the Cartagena Protocol on Biosafety relating to the risk assessment/management of synthetic gene drive organisms. This is an area of interest to ACRE. In 2015 ACRE provided written evidence for consideration by the House of Lords Select Committee on Science and Technology for its inquiry into Genetically Modified Insects. In 2020 ACRE responded to an EFSA consultation concerning the evaluation of EFSA guidance on EGD insects.

Members noted that information is being gathered from Parties to the Protocol and other stakeholders, to assist in the preparation of additional voluntary guidance materials to support case-by-case risk assessment of living modified organisms (LMOs) containing engineered gene drives (EGD). An Ad Hoc Technical Expert Group (AHTEG) will contribute to the preparation of draft outline guidance materials which will be reviewed by Parties to the Protocol at the next scientific meeting under the Convention on Biological Diversity – SBSTTA26.

4. OECD update (INF7)

A Defra official provided an update on developments from the Working Party on the Harmonisation of Regulatory Oversight in Biotechnology (WP-HROB), which sits within the chemicals and biotechnology committee of the OECD. Defra is currently engaged in several projects of the WP-HROB, including the safe (r) Innovation approach (SIA) project and the drafting of OECD consensus biology documents on two different mosquito species. ACRE noted the importance of insects as vector species particularly in the context of climate change (malaria and tick-borne diseases such as Lyme's disease are being actively monitored by health bodies). An additional scenario highlighted was where gene-editing for resistance in animals could lead to enhanced evolution of the pathogen. It was noted that such issues should be considered in any risk assessment. Members discussed post market environmental monitoring, particularly with respect to non-plant products versus standard pharmaco-vigilance practice, which can result in the recall of medicines where adverse effects have been identified. The issue of 'dual use' was also briefly raised as being of potential interest to the Safer Innovation Approach.

5. Environmental releases of GM viruses (INF8)

A Defra official updated members on a recent workshop on GM viruses that was attended by European GMO regulators. Several case studies were highlighted where genetically modified viruses had been developed - e.g. where the intended mode of action involves either continued replication within the recipient or onward transmission of the GMO to unmodified/untreated individuals in an unconfined setting thereby constituting and environmental release.

One such example was a vaccine against devil facial tumour (DFTD) disease in Tasmanian devils developed by the University of Tasmania. The GM vaccine (Wild Immunity Vector Adenovirus 20) consists of a replication defective human adenovirus serotype 5 vector modified to express tumor antigens. A detailed environmental risk assessment had been published by the Australian Office of the Gene Technology Regulator describing the potential risks from inoculating a small number of Tasmanian devils with the GM vaccine within a confined but open field site. ACRE reflected on the circumstances under which such interventions might be ethical/non-ethical. Members discussed whether the disease originally arose as a result of human intervention and whether species extinction was an inevitable consequence of non-intervention (based on insufficient levels of natural disease resistance within populations).

Other less developed examples included the application of GM viruses to control plant diseases by 'in-field' modification of plants, for example by using insect vectors to deliver genes, the introduction of virally encoded defensin genes via grafted scions in citrus trees and the use of engineered bacteriophages for conferring resistance to the plant pathogenic bacterium *Xylella fastidiosa*. ACRE noted that such applications involving environmental releases and complex biological interactions is an area of growing academic and commercial interest, and of ethical importance, which could potentially challenge regulatory frameworks in the future. Further comments concerned the frequent need to balance efficacy (which might rely on increased persistence and dissemination) with the risk of potential adverse effects, and measures for detecting harm.

The Chair reminded attendees that ACRE's July 2022 meeting included presentations on similar topics as an initial information gathering and horizon scanning event. He reiterated that ACRE will need to maintain a watching brief to monitor the trajectory of these and other new developments that involve environmental releases of microorganisms.

6. FSA update

An FSA official updated ACRE on progress to develop proposals for the regulation of food and feed products derived from precision bred organisms in accordance with the provisions of the Genetic Technologies (Precision Breeding) Act.

Following the FSA board meeting last month, FSA officials have been able to finalise plans for their consultation on this topic and this launches tomorrow (08/11/23). The Secretariat agreed to forward the links to the Committee when they become available.

A summary of the consultation proposals was provided. This demonstrated that the pre-market authorisation approach is reliant on a two-tier system. Tier 1 would be for products where the genetic change results in food or feed similar to that produced through traditional breeding - which do not require a review and where the genetic change is unlikely to have resulted in a significant change in composition, either directly or indirectly, to the part of the plant or animal that is eaten. In Tier 1, businesses may notify the FSA of a PBO product for authorisation having applied the Advisory Committee on Novel Foods and Processes (ACNFP) data requirement criteria. A recommendation will be made to the Secretary of State and if the decision is to authorise, the PBO is placed on a public register. The Tier 1 process will also be subject to a pre-market audit process.

Tier 2 PBOs will undergo a bespoke assessment. The application to the FSA will include the triage data used to determine Tier status and any additional data required for assessment based on trigger (ie novelty, composition or other safety concerns). FSA will then carry out a bespoke risk assessment followed by a recommendation to the Secretary of State. The Tier 2 process will broadly reflect that of other regulated products but is intended to be more streamlined with fewer data requirements anticipated and time taken between assessment, decision making and authorisation.

The public consultation runs for 2 months to early January 2024. FSA will prepare a response in accordance with the government code of practice on public consultations.

ACRE noted that a number of options were being considered with regard to the intended nature of the PBO identifier for the public register. Technical guidance to assist businesses navigate the new regulations is expected to be published to coincide with the new regulations coming into force. Precise details of the approach to gathering information to support the pre-market audit are currently being considered.

7. Update on QHP releases (INF9)

The Secretariat updated ACRE on the 12 notifications so far received for field trials with ‘qualifying higher plants’ in accordance with a 2022 amendment to the Genetically Modified Organisms (Deliberate Release) Regulations 2002. Details of these are published on the ACRE web pages and were summarised for the committee in terms of the diversity of species and traits:

Wheat

- ultra-low asparagine for lower acrylamide
- multiple yield determinants via knock out of SVP genes

Barley

- high lipid in leaves and stems for improved fodder quality
- improved nitrogen use efficiency via loss of GSK1

Oilseed rape

- pod shatter resistance

Potato

- reduced browning

Tomato

- conversion of provitamin D3 to vitamin D3 in sunlight
- improved harvesting via introduction of the 'jointless' mutation

Camelina

- modulated oil composition

American black nightshade (Solanum americanum)

- late blight resistance

ACRE noted that that material harvested from a QHP trial may not be permitted to enter the human food or animal feed chain. However, should a researcher wish to feed such material to humans or animals as part of an experimental trial, the regulation of this activity is of relevance to the Food Standards Agency, from a food and feed perspective. This is because technically, QHPs are still genetically modified organisms. The effect of the amendment is purely to nullify certain restrictions normally applied to GMO field trials, rather than removing GMO status.

8. Technical advances (INF10)

The Secretariat updated ACRE on technical advances in the genetic improvement of arthropods for a range of end uses including sustainable alternative protein sources. Articles cited in Nature Biotechnology (August 2023) describe some of the underlying fundamental improvements that could have a big impact. For example, researchers had demonstrated improved delivery of the CrisprCas ribonucleoprotein (RNP) complex to reproductive cells in mosquitos, cockroaches and flour beetles via bodily injection rather than embryo injection. The approach in mosquitos was facilitated through the attachment of an embryo-specific ligand to the RNP complex enabling its uptake into embryo cells via receptor-mediated endocytocis.

These approaches are likely to fall under GM contained use regulations as the insects are the result of the use of modern biotechnology (regardless of whether recombinant DNA is present in them). However, the lack of any introduced transgenic elements and the transient introduction of gRNA for editing purposes may mean that any release of these insects falls within the GT (PB) act and associated, future secondary legislation and not the GM deliberate release regulations.

AOB

The Secretariat highlighted that ACRE would need to review a new environmental risk assessment for a veterinary vaccine application (including co-opted expert Prof Andy Peters) which will be done by correspondence.

The Secretariat confirmed that queries about fees/expenses should continue be directed to the ACRE mailbox.

New members provided feedback on Cabinet Office training for non-executive directors.

Next meeting

The next meeting is scheduled for 20 February 2024.