

FOR IMMEDIATE RELEASE

Gene editing is not “precision breeding”: International scientists’ and policy experts’ statement

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Announcement by London-based molecular geneticist Dr Michael Antoniou of the publication of the international scientists’ and policy experts’ statement, “Gene editing is not ‘precision breeding’ and the term is misleading”:

The UK government is planning to remove or weaken regulatory controls around (“deregulate”) gene-editing technology in food and farming. It has published a draft bill, the Genetic Technology (Precision Breeding) Bill,¹ which is set to write these plans into law and is working its way through the Houses of Parliament.

The term “precision breeding”, in addition to its presence in the title and text of the UK draft bill, is also increasingly being used in the EU by those who want to see gene-edited crops, foods, and animals deregulated.²

Now a group of 56* international scientists and policy experts have published a statement opposing the use of the term “precision breeding” to describe gene or genome editing, on the grounds that it is technically and scientifically inaccurate and misleads the public, politicians, and regulators.

The scientists’ and policy experts’ position – that the use of term “precision breeding” to describe gene editing is inappropriate and misleading – is supported by the recently published “Genome Editing Vocabulary” by the International Organization for Standardization (ISO)³, which provides an internationally agreed-upon list of terms that will “improve confidence in and clarity of scientific communication, data reporting and data interpretation in the genome editing field”.

The terms “precision breeding” and “precision bred organisms”, both used by the UK government and its agencies, are nowhere to be found in the ISO document. It confines itself to factual scientific descriptive terms and avoids subjective marketing slogans. In the interests of clarity, the UK government’s new and far-reaching legislation should do the same.

Currently in the UK, gene-edited crops and animals – and the foods produced from them – are regulated under retained EU laws, which accurately recognise them as

¹ <https://bills.parliament.uk/bills/3167>

² ALLEA (2022). ALLEA provides expert advice to the European Commission’s public consultation on plants produced by new genomic techniques. 22 Jun. <https://allea.org/category/genome-editing/>; EPSO (2016). Site-directed nucleases. 21 Mar. https://globalplantcouncil.org/wp-content/uploads/2021/01/16_03_21_EPSO_New-Breeding-Technologies_Crop-Improvement_Fact-sheets.pdf; EU-SAGE (2021). EU-SAGE information. <https://www.eu-sage.eu/sites/default/files/2021-03/EU-SAGE%20information.pdf>

³ <https://www.iso.org/obp/ui/#iso:std:iso:5058:-1:ed-1:v1:en>

genetically modified organisms (GMOs). Under these laws, each gene-edited GMO must pass a risk assessment for human and animal health and the environment, as well as be fully traceable throughout the food chain, before it can be released into the food supply.⁴ As part of the traceability requirement, gene-edited seeds and food products must carry a GMO label.

The UK bill, as it currently stands, aims to scrap these safeguards. It fails to require an in-depth risk assessment, farm-to fork traceability, or GMO labelling for the consumer.

Crucially, it is misleadingly titled the “Precision Breeding” bill. Gene editing is not precise; nor is it breeding in any recognisable sense, being an artificial genetic modification procedure conducted on cells grown in dishes in the laboratory.

The aim of the bill’s title, and the wider use of the term “precision breeding”, would appear to be to give gene editing the appearance of controllability, predictability, familiarity, and therefore safety, implying that biosafety controls can be loosened or abolished. The signatories to the statement consider this a dangerous development and express strong disagreement with this use of the term.

Their concerns are based on the recognition that gene editing is an entirely lab-based process and in addition to creating the intended changes in the edited plants or animals, it inevitably causes unintended DNA damage, which could result in risks to the health of consumers, the environment and, in the case of gene-edited animals, welfare problems for the animals themselves.

Numerous types of widespread unintended DNA damage arising from the gene editing process are well documented in the scientific literature. They provide strong evidence that supports the application of robust regulations to gene-edited plants and animals. As a result, regulations should include a requirement for thorough risk assessments for human and animal health and the environment, as well as full traceability and clear on-package GMO labelling of the end products.

The scientists’ and policy experts’ statement was coordinated and initially drafted by me and has since benefited from the input of several of the signatories.

The statement can be viewed here:

<https://docs.google.com/document/d/1bTWTWZwwDHfReRaiA4Kt25Jfrqab4iNyAILAsEGTPR4/edit?usp=sharing>

Short link: <https://tinyurl.com/mr3kare7>

Further signatories are welcome and are invited to apply at this link:

<https://forms.gle/17VAFQvav6Avsi1B6>

* Update 15 Sept: There are now 80 signatories.

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⁴ It should further be noted that the reforms in the bill, as currently written, are not limited to agricultural products but extend to the use of genome editing in wild and free-living plants and animals.

Quote from signatory Dr Ulrich E. Loening, Hon. Research Fellow (School of Engineering), University of Edinburgh, UK; retired: Reader in Molecular Biology; Director of the Centre for Human Ecology:

“‘You can never do merely one thing’ is a basic law applying to all of life. Changing one gene inevitably has multiple unknown effects.”