Written evidence from Agricultural Biotechnology Council (abc) (ENB0025)

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Respondent type: umbrella group for the agricultural biotechnology industry in the UK
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Introduction and Executive Summary: Engineering biology stands to play a vital part of the UK economy and is a sector ripe for playing a role in making Britain a 'Science Superpower', especially in the realm of agricultural technology and agricultural biotechnology. The applications of agricultural innovation are vast – from growing more robust and nutritious crops with less space and less water.

abc, part of CropLife UK, is the umbrella group for the agricultural biotechnology industry in the UK, comprised of four member companies, Bayer, BASF, Corteva and Syngenta. abc works with industry and the research community to invest in a broad range of crop technologies, including gene editing and GMOs.

We focus our response on precision breeding in crops. Precision bred – or gene edited (GE) crops – possess genetic changes that could have been introduced by traditional breeding. These are crops created by gene editing or other genetic techniques, foe which it has been confirmed that no integration occurred of elements used during the process (which are not intended for integration) and which in principle could be obtained by conventional breeding. In comparison, genetic modification (GM) in agriculture is the engineering of a crop's DNA, usually through the introduction of a new trait from another species (transgenesis), to make a plant more resistant to certain pests, diseases, or environmental conditions, or improve the nutrient profile of the crop. Our responses will also focus on GM, using this definition, where appropriate.

Questions

1. What are the UK's key strengths in the area of engineering biology?

What is the current economic impact of engineering biology on the UK and what might its potential economic impact be?

The agri-tech sector is fundamental to the vision of a global Britain, contributing £14.3 billion to the UK economy – an amount expected to surpass £16 billion by 2030 – and employing over 500,000 people nationally[1]. The broader agri-food sector contributes £96 billion, representing 7% of the GVA. The integration of engineering biology could significantly enhance these contributions, particularly in areas such as food security, sustainability, climate change, and helping the UK achieve its net zero ambitions.

England is on course to adopt one of the most progressive and enabling regulatory systems in the world. This could unlock significant investment and economic activity by plant breeders and, combined with the UK's world-leading science base in crop genetics, could establish Britain as a global hub for gene editing research and innovation. This will stimulate job creation and technological advancements across related industries.

2. What are the key applications for engineering biology?

Can you give examples of particularly exciting or interesting applications? In particular, applications which could be taken forward or are being worked on in the UK?

An example of the successful application of engineering biology within the UK can be demonstrated through the proven success of the blight-resistant potato. Pioneered in the UK and highlighted in the *Embracing Agriculture Innovation* report, these genetically modified crops, though currently commercially available in the US, exemplify the UK's capacity for innovative agricultural solutions[2]. They represent the potential for the UK to lead in the development and commercialisation of agricultural innovations such as GE and GM crops, contributing to global food security and sustainability.

On what timescales might the different applications for engineering biology be realised? Which applications are emerging now, and what is on the horizon in the next 5–10 years or further ahead?

Our ability to construct complex genomes coupled with synthetic biology is allowing us to build biofactories to produce complex biomolecules or new examples of existing biomolecules, or to simplify the production of current materials. Whilst GM options are difficult to commercialise in the UK, there are industries already commercially active where the output is generated by genetically modifying microorganisms, including Colorifix, a

[1] https://www.gov.uk/government/news/business-secretary-calls-for-new-tech-revolution-in-agriculture
[2] https://www.yumpu.com/en/document/view/66809219/embracing-agricultural-innovation

2024 finalist for the Earth Shot prize, for its innovative delivery of dyes to the fashion industry using GM bacteria. Construction of new synthetic pathways in plants is also opening up options in nutrition, with anthocyanin overproduction resulting in commercialised heath-healthy "purple" tomatoes, and vitamin-enhanced tomatoes. Golden rice is also a long-established example of how knowledge and tools can be used to solve otherwise difficult-to-crack nutritional issues.

Are there areas of application for engineering biology where the hype exceeds the reality, or where significant barriers remain?

A significant barrier is that of the UK's approach to engineering biology, which is held back by its current approach to regulation. The UK stands to learn from Canada, which has already implemented pro-innovation policies[3]. Canada's method underscores a science-based approach to regulations and the benefit of interagency collaboration. This ensures a comprehensive and cohesive regulatory environment that can effectively address multiple facets of agricultural biotechnology, alongside providing a stable regulatory environment that promotes investment opportunities. To stay competitive, the UK must act swiftly and strategically to not only catch up but potentially overtake these countries in the realm of engineering biology. To do this, we firmly support the recommendations from the FSA that would mirror the Canadian model[4]. Failure to implement these regulatory updates poses a substantial risk of investment diversion to alternative markets.

Where does engineering biology have the potential to add value over processes that are currently used? What is the nature of this added value (e.g. throughput, sustainability, range of processes that are possible)? Which industries are most likely to be affected?

Food security: Food security is national security, and a greater adoption of engineering biology such as gene editing technology would lead to greater food security by helping farmers avoid food waste and lost yield. Crop genetic improvement can result in the production of more food per acre – which is key given that estimates suggest farmers will need to produce 70% more food by 2050 to serve the world's growing population[5].

By increasing food yields and reducing the proportion of crops that are prone to disease, gene editing can help generate greater resilience in the

[3] https://www.canada.ca/en/health-canada/services/food-nutrition/genetically-modified-foods-other-novel-foods/scientific-opinion-regulation-gene-edited-plant-products-within-context-division-28-food-drug-regulations.html
[4] https://www.food.gov.uk/board-papers/genetic-technology-precision-breeding
[5] Food and Agriculture Organisation of the United Nations, *2050: A third more mouths to feed*, https://www.fao.org/news/story/en/item/35571/icode/

UK food and farming system by producing crops with greater nutritional value that require less land. Agri-tech innovation has the potential to help deliver improved food security and support sustainable high-yield farming, for example by giving farmers a choice of better crop varieties and allowing farmers to produce what is needed while using less land. As such, embracing agricultural innovation is needed to equip us to meet the food needs of the rising global population.

Net Zero and Sustainability: Techniques like Genetically Modified (GM) insect-resistant seed technology have been proven to significantly reduce greenhouse gas emissions. For example, during 2020 alone, emissions reduction across UK agricultural practices owing to GM seed technology was the equivalent of taking 15.6 million cars off the road. This huge figure equates to 49% of all cars currently registered in the UK[6]. This example demonstrates how agricultural innovation can play a crucial role in helping the UK to achieve its Net Zero targets. Moreover, Gene Editing (GE) too can play a key contributing role, supporting farmers to meet the UN's Sustainable Development Goal to produce higher-yield crops with lower environmental impacts through growing more nutritious and robust crops on smaller areas of land in a changing climate[7]. Researchers have already explored the use of GE tools to make the production of bread-wheat crops more sustainable. Bread-wheat is a major staple crop worldwide, but it incurs significant yield losses from powdery mildew, a disease caused by a specific fungus[8].

Throughput, Efficiency, Processes: Engineering Biology, especially through GE techniques, can substantially increase agricultural output. It enables the production of more food per acre, which is crucial considering the predicted rise in global food production needs. By improving crop genetics, GE not only boosts the amount of food produced but also reduces the susceptibility of crops to disease, pests and environmental stresses. Engineering Biology allows for a broader range of agricultural processes by making it possible to tailor crops to specific environments and environmental conditions. For instance, developing drought-resistant crops or those that can thrive in suboptimal soil conditions can dramatically change the agricultural landscape. This flexibility is particularly valuable in adapting to climate change and unpredictable weather patterns.

How does the UK compare to other countries, such as Germany, the US, or China, in terms of investment and policy activity, as well as areas of specialism?

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[6] G. Brookes, *Genetically Modified (GM) Crop Use 1996-2020: Impacts on Carbon Emissions,* (National Library of Medicine).
[7] abc, 'Seizing the gene editing opportunity', (2020) p5
[8] abc, 'Seizing the gene editing opportunity', (2020) p6.

The Agricultural Biotechnology Council represents four major multinational companies, Bayer, BASF, Corteva and Syngenta. We operate in many countries across the globe, working with many unique and often complex regulatory environments, and we are well-placed to advise on how different types of regulatory models work in practice, and how they can impact on the operating environment for businesses and investment opportunities. For example, we have a detailed understanding of the Canadian regulatory framework, and we would be happy to lend our expertise on how this model operates as the UK Government looks to pass secondary legislation for the Precision Breeding Act (2023).

EU: One of the primary is the need for the application of effective, innovation-friendly regulation. The current regulatory framework, especially the role played by regulators such as the Food Standards Agency (FSA), has faced criticism for taking a cautious interpretation of novel innovation causing impediments to scientific advancement and economic growth in the food and agricultural sector. The UK should consider adopting a regulatory framework made feasible by the Retained EU Law (Revocation and Reform) Act and the Precision Breeding Act. Such a framework should actively promote innovation rather than inadvertently hinder it. We firmly believe that a balanced approach, one that safeguards consumer safety and confidence while embracing advancements in science, productivity, and environmental sustainability, can lead to substantial benefits for the UK. Redirecting attention towards fostering a competitive operating environment has the potential to yield economic advantages, create job opportunities, and attract future investments.

Following the most recent FSA Board Meeting in September 2023, it is encouraging to note the progress being made in recognising the advantages of proportionate regulation and acknowledging the high level of safety associated with gene-edited crops. The UK government should be aware that the EU is already taking steps to open its market to gene-edited products to "strengthen the resilience of EU food systems and farming"[9]. If this were to happen before the UK provided stable, proactive, and science-led regulatory legislation in the UK, there is a significant risk of the UK being placed on the back foot and losing investment opportunities.

Canada and global competition: A second challenge is that of the growing competition from other countries. Canada, for example, has already implemented pro-innovation policies[10]. In May 2022, Canada revised its GE regulation guidelines within the framework of novel food regulations.

[9] https://ec.europa.eu/commission/presscorner/detail/en/IP_23_3565
[10] https://www.canada.ca/en/health-canada/services/food-nutrition/genetically-modified-foods-other-novel-foods/scientific-opinion-regulation-gene-edited-plant-products-within-context-division-28-food-drug-regulations.html

This update specifies that it is the characteristics of the product, not how it was developed, that determine if a pre-market safety assessment is required. The updated guidance puts new plant breeding techniques, including gene editing, on the same regulatory footing as conventionally bred techniques.

The UK stands to learn from Canada, especially when supporting farmers with regulations and policies that encourage innovation, and when equipping farmers with the necessary tools to enhance productivity and meet the increasing demands placed on them. Central to Canada's strategy is the aim to avoid unnecessary regulation for novel food and crops, and this approach acknowledges the role of GE crops in supporting Canada's climate goals and achieving sustainability targets and food security. Moreover, Canada's method underscores a science-based to regulations and the benefit of interagency collaboration. This ensures a comprehensive and cohesive regulatory environment that can effectively address multiple facets of agricultural biotechnology, alongside providing a stable regulatory environment that promotes investment opportunities.

Specialism: The UK is performing strongly in the field of research. Universities like Oxford, Cambridge, and Imperial College London are consistently ranking high globally, showcasing the excellence we've achieved in research and innovation. Our response during the Covid-19 pandemic underlined the strengths of our life science sector, pushing the government's goal of becoming a significant player in this domain.

In the agricultural sector, we have a broad spectrum of research institutions situated throughout the country. Notable mentions include Rothamsted Research in Hertfordshire, Harper Adams University in Shropshire, and the agri-tech centre at Scotland's Roslin Institute. An investment in research and innovative tools in this sector promises significant returns. Furthermore, the UK boasts of a rich infrastructure supporting agri-tech. We're home to approximately 100 science parks and four primary Centres for Agricultural Innovation. These centres encourage collaboration among government officials, academics, and industry experts, aiming to improve the overall efficiency and output of the agri-food sector.

3. How can Government policy support the development of engineering biology?

Which are the key enabling technologies that have developed in recent years that have enabled wider applications for engineering biology?

A key technology developed in 2012 has been CRISPR Cas which is powerful as allows the specific editing of the genome. Such a tool is used in basic research and since our knowledge has significantly increased due to innovations in genomics, proteomics, metabolomics and phenotyping, it allows us to use it in the creation of commercial products. At this moment, it is thought that AI will help us to further increase the pace at which we understand biology.

To translate the acquired knowledge into applications the regulatory framework is essential. We have seen that innovative products be it in the area of plants or microorganisms have first come to the market in South America since policymakers aim to ensure that the regulatory framework keeps track of innovations. The applications can vary from simple modifications to removing antimicrobial resistance genes in microorganisms which could speed up the risk assessment (if regulations are product-based rather than process-based), or could help us to biofactories within a contained environment. For agriculture having additional tools available for plant breeding but also for biological solutions will be key to ensure the transition to a more sustainable agriculture.

The fundamental sciences that underpin Engineering Biology include engineering, computational modelling, genomics, molecular sciences, and genetics. All are required, and a lack of access to one limits progress in another. The Genetic Technology (Precision Breeding) Act 2023 has not only inserted a key technology into the engineering biology toolkit but has also invigorated the commercial potential of this industry and has attracted investment in the area. Many of the mechanisms of engineering biology are underpinned by an ability to genetically modify an organism, however, if the output is a plant or an animal, any commercial exploitation in the UK is unlikely to occur under current legislation. AI (artificial intelligence) and machine learning are critical to understanding and predicting biological systems and allow scientists to analyse data in ways that would not have seemed possible even just a decade ago. This is fundamentally changing the productivity and options available in this field.

4. How can the UK maximise the economic potential of developments in engineering biology?

What can the Government do to encourage investors to invest in engineering biology and is there a need for investors with more scientific expertise?

We have encountered several regulatory issues that have hindered progress when encouraging investors to invest in engineering biology. The main challenge lies with regulatory bodies operating under a precautionary principle regarding the use of technology inherited from the EU, rather than embracing a more innovative approach post-Brexit based on protein safety. This hampers the UK's ability to exploit its regulatory advantage over the EU for economic growth. A specific issue is the cumbersome process for assessing "stacked events" in genetically modified organisms (GMOs), treating each trait combination as a new GMO, despite prior approvals. This contrasts with practices in other countries like the USA and Japan, where such assessments are streamlined due to the safety record of conventional breeding. Additionally, the EU's requirement for renewing GMO approvals every ten years adds administrative burdens without enhancing product safety, unlike practices in the USA and other countries.

Transposing EU GMO regulations into UK law post-Brexit has also led to delays and uncertainties, hindering the development and commercialisation of GMO products, alongside investment into these products. The removal of certain EU regulations could enable more tailored and future-proof risk assessments in the UK that further support investment initiatives. However, fixing risk assessment requirements, as seen with the now-repealed Commission Implementing Regulation, could stifle innovation and overlook advancements in risk assessment methods, such as in vitro studies that could reduce reliance on animal testing, impacting both safety and animal welfare considerations. To overcome these challenges, we believe that the UK needs to adopt a more streamlined, pro-innovation regulatory framework that encourages investment. This can be done:

- Through secondary legislation for the Precision Breeding Act for PB products.
- Regulatory divergence, potentially following the retained EU Law (Revocation and Reform) Act, for example, to deliver a simplified approval process for stacked events, streamlining the renewal process for GM products.
- Establishing an act on gene-edited microorganisms, similar to the PBO act on plants and microorganisms.

With these changes, we believe that the UK can create a regulatory environment that stimulates economic growth, encourages continued investment and sustains innovation in the field of engineering biology.

How does the UK's approach to engineering biology, commercialisation and translation compare to other nations, such as Germany, China and the US? Are there specific areas the UK should look to focus on to gain or maintain a competitive advantage?

Canada: The UK's approach to engineering biology is held back by its current approach to regulation. The UK stands to learn from nations such as Canada, which has already implemented pro-innovation policies as earlier discussed[11]. Canada's method underscores a science-based approach to regulations and the benefit of interagency collaboration. This ensures a comprehensive and cohesive regulatory environment that can effectively address multiple facets of agricultural biotechnology, alongside providing a stable regulatory environment that promotes investment opportunities. To stay competitive, the UK must act swiftly and strategically to not only catch-up but potentially overtake these countries in the realm of engineering biology. To do this, we firmly support the recommendations from the FSA that would mirror the Canadian model[12]. We are pleased to see the recommendations of the FSA align with pro-innovation regulation in other countries, such as Canada. If adopted in secondary legislation, the tiered approach to PBOs will provide the best opportunity to increase investment, innovation, and build on the strengths already present in the UK.

5. What are the risks posed to society by engineering biology?

There are regulatory, ethical, and safety concerns that go along with any dual-use technology, particularly in the case of gene editing. What are the major areas of concern?

Common concerns regarding gene editing in agriculture often revolve around safety, often fuelled by misinformation and exaggerated claims. Addressing these concerns can be effectively achieved by fostering public interest and awareness in gene-edited products, offering accurate information, and highlighting the potential benefits they bring. Evidence suggests that consumers are open to crops grown using agricultural innovation, partly considering climate challenges and food security concerns during the pandemic, alongside elevated concerns regarding food costs and supply following the Russian invasion of Ukraine. Polling commissioned by abc has revealed that 81% of those surveyed agreed farmers should be able to benefit from innovations that could help them play their full role in meeting the UK's climate change ambition of reaching 'net zero' by 2050, whilst 57% supported making food

[11] https://www.canada.ca/en/health-canada/services/food-nutrition/genetically-modified-foods-other-novel-foods/scientific-opinion-regulation-gene-edited-plant-products-within-context-division-28-food-drug-regulations.html
[12] https://www.food.gov.uk/board-papers/genetic-technology-precision-breeding

production a more sustainable process using more innovative farming techniques and methodologies[13]. Consumers should have the freedom to choose food produced using safe techniques that enable improvements in food quality and allow crops to be grown with reduced environmental impacts. This can only be achieved if there is a stable route to market for gene-edited products.

6. How should engineering biology be regulated?

Is the current regulatory framework adequate? Does it strike the right balance between encouraging innovation and ensuring safety? Where should any reforms be enacted?

In the process of developing, scaling and commercialising products using engineering biology, we have encountered several regulatory issues that have hindered progress. The primary issue has been with the regulatory bodies, which operate on a precautionary principal remnant of the EU framework rather than an 'innovation first' approach which Brexit could deliver and should be the direction of travel as the UK looks to grow the economy. This has resulted in a regulatory environment that is disproportionate to risk and is not conducive to innovation.

Our primary method of navigating the regulatory system has been patience. However, this approach is increasingly untenable. The size of the UK market alone does not provide enough incentive for companies to invest in the development and commercialisation of agriculturally innovative products. Moreover, the lengthy and uncertain regulatory process discourages investment and innovation. To overcome these challenges, we believe that the UK needs to adopt a more streamlined, pro-innovation regulatory framework.

How are the ethical, safety, and national security concerns raised in Q5 addressed under current regulations? Are regulators sufficiently independent from Government and from industry?

It is encouraging to note the progress being made in recognising the advantages of proportionate regulation and acknowledging the high level of safety associated with gene-edited crops. However, significant challenges remain concerning the UK's approach to safety, including public perception. To build further the public's interest and confidence in biological engineering, including GE and GM products, both industry and Government must strive to demonstrate the safety of these products themselves. The FSA and the Food and Agriculture Organization of the

[13] https://abcinformation.org/britons-want-farming-on-the-agenda-for-cop26-and-want-farmers-to-have-access-to-agricultural-innovations-to-respond-to-climate-crisis/

United Nations have been clear that Precision Bred Organisms (PBOs) present no additional risk when compared to traditional breeding[14] Facts such as these need to be clearly understood by officials and explained when promoting technology to the public. Public confidence in GE products is currently undermined by a lack of transparency about the process despite 86% of Britons wanting to see improved education around the journey from farm to fork[15].

What implications would rapid progress in engineering biology have for existing regulatory structures, ~~for example around intellectual property?~~

The current regulatory structures in the UK hinder innovation rather than facilitate it. To promote innovation, drive scientific progress, and foster economic growth, we must simplify and streamline our regulatory processes.

Has regulation in this area evolved quickly enough? Are regulators sufficiently resourced, in terms of expertise and budgets, to keep up with the pace of change of science? How does scientific evidence feed into the regulation of engineering biology? What should the Government do to ensure the regulatory environment is able to keep up?

The UK must have an agricultural sector which is supportive of research and development. As stated, the government should be commended for the passage of the Precision Breeding Act 2023. It has the potential to enable a critical technology for resilience, sustainability, and prosperity. However, to realise this vision, the secondary legislation now under development must be driven by science rather than perception and we recommend that the government accepts recommendations laid out by the FSA to create a two-tiered approach to PBOs.

The sector in the UK currently can instigate change which would result in significant efficiency gains for our farmers. Regulatory reform of the GMO framework in the UK is becoming more urgent as timelines for review increase. Therefore, in the absence of any formal changes to existing retained EU legislation, abc encourages those in the public sector to assess key opportunities available to them – like the flexibility currently granted by Article 5 in the retained EU Commission Implementing Regulation EU 503/2013, which would allow for the submission of a fit-for-purpose and proportionate data package for the safety assessment of

[14] https://www.fao.org/documents/card/en/c/cc5136en
[15] https://abccropscience.co.uk/britons-want-farming-on-the-agenda-for-cop26-and-want-farmers-to-have-access-to-agricultural-innovations-to-respond-to-climate-crisis/

crops with GM traits in GB – to drive forward the UK's scientific development.

The Retained EU Law (Revocation and Reform) Act still provides an opportunity for GB authorities to align with countries that have followed a science-based and proportionate approach to GM crop regulation. It means that we will no longer sit behind other nations in our approach to crop regulation and indeed, not fall further behind them. Within this, the removal of Commission Implementing Regulation (EU) No 503/2013 would allow for GB-specific fit-for-purpose and future-proof risk assessments. As we have outlined, risk assessment should be scientifically justified, hypothesis-driven and based on the most recent knowledge about any potential known hazard or exposure. By opening up the regulatory space in this way, we can support success, innovation, and growth, in both the public and private sectors, alike.

Despite leaving the EU, UK civil servants and regulatory bodies are often still working under the EU's precautionary mindset, instead of looking to boost growth and innovation. If the UK is left with a slow, onerous system, the UK will surrender its competitive advantage in this space. A precautionary regulatory framework relying on a disproportionate process will restrain the growth of the sector at its point of greatest opportunity. We are pleased to see that the FSA understands this point and has recommended viewing PBOs in the same prism as conventional breeding, rather than from the GM precautionary principle which has plagued the EU for so long. In this context, the role of regulating bodies like the FSA becomes paramount. It is important to ensure that the FSA has the necessary knowledge, expertise, and manpower to effectively regulate the sector. This includes understanding the technical aspects of engineering biology, as well as the ability to assess the risks and benefits of the technology and make informed decisions with up-to-date knowledge of global best practices.

The recent passage of the Precision Breeding Act has the potential to accelerate the development of this sector. However, to fully realise the benefits of this progress, the FSA must remain up-to-date with the latest developments in the field. This requires continuous learning and capacity building within the agency. Moreover, it is important to foster a dialogue between the FSA and industry. This will not only facilitate a better understanding of the regulatory requirements but also ensure that the regulations are in line with the current state of the technology. If the FSA falls behind, the UK risks losing out on the benefits of the progress made in the sector. Additionally, as stated in previous answers, the UK's

regulatory frameworks must align with countries that have followed a science-based and proportionate approach to GM crop regulation. We believe that UK regulators already are aware of the benefits these technologies can have, and already possess the knowledge, expertise and skills to achieve this through effective regulation.

What should the Government do to ensure the regulatory environment can keep up?

The UK Government can utilise communication with stakeholders across the engineering biology landscape. This includes academia, industry, investors and regulators, to identify areas for improvement and how best to deliver science-led regulation that fosters an innovative and forward-thinking environment which supports UK investment and economic growth.

7. What are the possible barriers and limitations to good and effective use of engineering biology?

What more can the Government do to foster public understanding of engineering biology? Is public acceptability of these technologies a barrier to deployment in the UK?

According to polling carried out by abc, the British public wants their government to invest in science and ensure the UK's position as a global hub for innovation. abc polling found that abc polling found that 52% of respondents supported new agricultural innovations such as new plant breeding techniques like gene editing to make crops more nutritious and resistant to pests, to help the food and farming sector remain resilient. Additionally, 63% of consumers surveyed said they were concerned about the consequences of climate events such as drought.[16]

Throughout the British public, there exists a desire for government to further promote science and innovation. Additionally, there also exists an undeniable anxiety regarding the climate crisis and its possible effects on our food security. Agricultural innovation represents a unique example of where a solution to these two issues intersects, as greater investment in this area would buttress Britain's position as a global hub of science and innovation, whilst striving to mitigate the forthcoming effects of the climate crisis. To further build the public's interest and confidence in engineering biology and GE and GM products, both industry and

[16] https://abccropscience.co.uk/britons-want-farming-on-the-agenda-for-cop26-and-want-farmers-to-have-access-to-agricultural-innovations-to-respond-to-climate-crisis/

Government must strive to demonstrate the safety of the products themselves. The Food Standards Agency (FSA) and the Food and Agriculture Organization of the United Nations have been clear that Precision Bred Organisms (PBOs) present no additional risk when compared to traditional breeding. Facts such as these need to be clearly understood by officials and explained when promoting technology to the public. Public confidence in GE products is currently undermined by a lack of transparency about the process despite 86% of Britons wanting to see improved education around the journey from farm to fork.

Does lack of land (e.g. for biofuels or growing GM crops) or dedicated lab space inhibit the growth of engineering biology? If so, what should the Government do to address this?

One significant benefit of gene-edited crops is that they can support farmers in producing higher-yield crops with lower environmental impacts by growing more nutritious and robust crops on smaller areas of land and within a changing climate. Gene-edited crops can help farmers meet increasing demands for global food supply, whilst limiting our impact on the natural environment. Current UK regulations only allow GE crops to be planted in England and not in Wales or Scotland. This divergence in regulation between the devolved nations can cause complications and difficulties, including reducing the opportunity to tackle matters such as UK food security and utilise growing spaces that would be available for GE crops.

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