HOUSE OF LORDS

Revised transcript of evidence taken before

The Select Committee on Science and Technology

Inquiry on

GENETICALLY MODIFIED INSECTS

Evidence Session No. 8 *Heard in Public* *Questions 75 - 86*

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11.40 am

Witnesses: Mr George Eustice MP and Mr George Freeman MP

USE OF THE TRANSCRIPT

This is a corrected transcript of evidence taken in public and webcast on www.parliamentlive.tv.

Members present

Earl of Selborne (Chairman)
Lord Cameron on Dillington
Lord Fox
Lord Hennessy of Nympsfield
Lord Hunt of Chesterton
Lord Kakkar
Lord Krebs (co-opted)
Lord Maxton
Baroness Morgan of Huyton
Baroness Neville-Jones
Lord Patel (co-opted)
Lord Peston
Viscount Ridley
Lord Vallance of Tummel

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Examination of Witnesses

Mr George Eustice MP, Minister of State for Farming, Food and the Marine Environment, Department of the Environment, Food and Rural Affairs (Defra), and **Mr George Freeman MP**, Parliamentary Under-Secretary of State for Life Sciences, Department for Business, Innovation and Skills (BIS) and the Department of Health (DH)

Q75 The Chairman: Welcome, Ministers. We are grateful to you for joining us this morning. We are nearly coming to the end of our inquiry into genetically modified insects and the potential for this new technology and the regulatory background to it. We are being broadcast by the web cameras, so I should warn you of that. Would you like to introduce yourselves for the record and, if you would like to make an introductory statement, please feel free to do so?

Mr Freeman: Thank you, Lord Selborne, and the Committee, for the invitation. I am George Freeman, Minister for Life Sciences at the Department for Business, Innovation and Skills and the Department of Health. As well as my core job, which is focusing on developing our UK infrastructure for medical innovation, the Prime Minister has asked me also to support the policy framework at the Department for Business, Innovation and Skills for the bioeconomy, for the appliance of bioscience and for industrial biotech more broadly with Jo Johnson, the Science Minister. We are actively looking at ways in which we can support the UK leadership in that rapidly growing global field of the appliance of bioscience particularly in food, medicine and energy, and in industrial biotechnology more generally. We have a range of programmes at BIS for supporting it, which no doubt we will touch on. As the BIS Minister responsible for the agri-tech strategy working with George, as Minister at Defra, I am leading the work at BIS on supporting the deep science for 21st-century agriculture to help British farmers produce more from less and to help Britain export that technology to help emerging markets.

I would just say on this issue—George will lead on the regulation, because that is a Defra function—that genomics and genetics are playing an increasingly transformational role in biomedicine but also in energy and agriculture. The UK is a global leader in the study of genetics and the study of how we can harness genetics for clinical as well as agricultural and other industrial benefits. Crucial to that is making sure that we support the raising of sufficient funds to support the science base and to build an ecosystem in which that science can support emerging companies and support emerging technologies with existing companies, and to make sure that we get the international framework right. We see a huge opportunity for the UK to attract inward investment into our science base and to export that science expertise to support technologies around the world.

The idea behind the agri-tech strategy is that as the world faces some pretty profound challenges to double food production on the same land area, BIS, working with Defra and DfID, has a key role to play in making sure that we are supporting those technologies for tomorrow.

George is going to lead on the regulatory aspects, because they are a Defra function. On the medical sector, the genetic modification of insects, particularly the drosophila fruit fly, has been essential in some ground-breaking medical research. Last week I visited the MRC institute at Hammersmith, where the study of the drosophila fruit fly intestine and genomic and metabolic science is leading insights into human metabolic science as well. In the medical sphere, a lot of this work is completely accepted and the genetics of insects for research is crucial, although I appreciate that today we are talking about a particular aspect of that, which Defra leads on the regulation of.

The Chairman: Thank you. Mr Eustice.

Mr Eustice: I am George Eustice. I am the Minister for Farming, Fisheries and the Marine Environment. Also, as part of that, I lead on agri-tech, particularly regulation on pesticides and GM crops. When it comes to the EU regime on GM regulation, we do not think there is anything particularly wrong with the regime as written, but there is certainly a great deal wrong with the way it is implemented, in that if all member states followed the evidence and had a risk-based approach, there are actually lots of checks and balances in the system, but there is no reason why an application, if it were proved to be safe, should not proceed to commercial cultivation in a relatively straightforward way and in a relatively short timeframe. In practice, we have seen, frankly, political deadlock over the last 10 years between member states and an inability to get qualified majority voting to block cultivation, or indeed to allow cultivation, and a feeling generally from the Commission that because this is such a divisive hot potato, there are usually lots of reasons to ask for more evidence and new reviews and for outdated information to be updated. So we tend to have applications that have been stuck in limboland in most cases for many, many years. We hope that the agreement reached last year on allowing national derogations for commercial cultivation might unblock that logjam and make other member states less inclined to try to block these cultivations so that we can allow member states that want to do the commercial cultivation of crops that are shown to be safe to do so.

Finally, because the specifics of your inquiry are GM insects, which I think is a really interesting area, I should say that sterile insect techniques have been around since the 1940s and the process of radiating insects and releasing them is not new, but what is new is using GM technology to achieve the same result. It is encouraging that companies such as Oxitec,

which is a UK company, are world leaders in this field. In principle, from a regulatory point of view, we do not see any reason why the GM process that exists for crops in the EU should not equally be applied to GM insects, were any such applications to come forward, but at the moment there is no indication of anybody wanting to do even field trials on GM insects in the UK or in the EU.

The Chairman: No indeed, as we understand it.

Q76 Lord Kakkar: I think, if I have understood it correctly from those opening statements, that the Government are strongly enthusiastic about the development of GM insect technologies.

If I may move on from that first question, unless you disagree with that, do you think that independent scientific advice informs the UK Government position on these technologies, and if so how, and how you think independent scientific advice might better inform the European scenario that you have just described?

Mr Eustice: In the UK, if we have an application from a company that wants to do field trials of particular GM technology, Defra is the lead competent authority that assesses the application. We would then go to ACRE—the Advisory Committee on Releases to the Environment—which is an expert committee that has been established for many years now. They would carry out an assessment and actively peer review the science that a particular technology developer was bringing to the field and would make a recommendation to Ministers. As a general rule, we would follow that advice. In fact, I do not think there has been an instance yet where a Minister has gone against the advice of that expert committee.

When it comes to the European Union, if you want to commercialise a crop so that we have control nationally on trials and to get commercialisation on an EU level, a developer would, for the sake of argument, come to the UK and we would then lead on risk assessing the commercialisation. Again, we would take advice from ACRE, our expert committee on that, and if we were satisfied that it was safe for commercialisation we would inform the Commission and notify all other member states. If all other member states agreed with that assessment, it could proceed to commercialisation quite quickly. That process could happen probably within six months. What tends to happen is that member states that have more political objections to these technologies find reasons to question the science, to question the recommendation. Again, that is foreseen in the process, so when that happens the Commission asks the EFSA—the European Food Safety Authority—to carry out its own independent assessment. When that authority concludes, it then makes a recommendation to the Commission, and at that point the matter should go to a vote and either be carried or not under QMV. The difficulty is that whenever these have come back and gone to QMV, there is never a QMV to do either one thing or the other. What should happen at that stage is that the Commission can go ahead and authorise it if that is where the balance of evidence lies. I hope that it will be more inclined to do that now that we have allowed the national derogation.

Lord Kakkar: Minister, you will be aware of the report on our nation's footprint in terms of global health, and here I should declare my interest as an officer of the All-Party Parliamentary Group on Global Health. Do you think that the particular process just described is holding back our ability to take forward these technologies—I think from your answers that we have heard that the Government support GM insect technology—and that

we should ensure that they can be applied more broadly throughout the world to help us make a contribution to tackling important global health problems?

Mr Freeman: I think, Lord Kakkar, that you put your finger on a really key issue that sits behind and across this particular subject. It is a well-timed question. On Monday I am going to meet Commissioner Moedas and speak at the European Bioeconomy Investment Summit to signal that as the world stands at the dawn of an extraordinarily exciting age of bioscience in the bioeconomy, there is the opportunity to harness genomics and informatics and these technologies, which have really been pioneered in medicine but have extraordinary applications across agriculture, energy, clean tech and industrial cropping for sustainable development. We are concerned that the European Union should not just actively invest in the science, which it is doing, but equally puts in place a regulatory framework that as well as building public trust and confidence in the regulatory protections actively supports investment into the European bioeconomy for the creation of jobs and prosperity. There are signs at the moment in medicine and in agriculture, and in some of the emerging areas where different technologies are creating new opportunities where food and medicine meet and some of the latest technologies, that the European Union is in danger of sending a signal through a zealous application of the precautionary principle that the assumption is no until everybody in the system is perfectly happy to say yes. That will send a bad signal, and we have already seen some disinvestment from Europe. There is a strategic question here of science advice.

I would just add that the UK leads. We have more scientific advice at the heart of Government in the UK than any other country. We not only have the Chief Scientific Adviser, but every department has a chief scientist. For decades, we have led in science and evidence-based policy-making, and we are keen to ensure that the European Union adopts that and puts science right at the heart of evidence-based policy for the 21st century.

Q77 Viscount Ridley: I hope I am not pre-empting a later question. We heard a pretty shocking statement from Oxitec that they would never in a million years dream of raising funds to do their work here in the UK, because it would be impossible to get regulatory approval. That is after their experience with olive fly in Spain. There are plenty of insect pests in this country that we would like to tackle, such as flea beetle or aphids. There is something wrong when we are able to lead in the development and commercialisation of this technology but there is not a hope of applying it here.

Mr Freeman: You make a really important point, which echoes the one I made in response to Lord Kakkar, that there is a very big difference between the application and the licensing of technologies for use in the UK and the UK science base being able to develop solutions for global use. This is particularly heightened in the wider GM debate, where there are some extraordinary opportunities for GM crop advances, industrial biotech, drought-resistant crops, pest-resistant crops, and global and tropical agricultural use but which are being held back by a European regulatory framework that is about “protecting” European consumers. There is a real issue for the UK, if we are ambitious for our science base, to help global agriculture and global energy. GM technology is taking off across the world. The question is not whether we are going to stop it; the question is whether we are going to help contribute to leading it and getting the right regulatory framework in place.

Mr Eustice: I think there is another point to note when you are looking specifically at GM insects. I can understand the point of view of people who might be concerned about this

that there is a difference between insects that are sterile, and therefore self-limiting because they die anyway and that is the end of the gene, and, say, gene drive technologies where you are introducing a gene into an insect population. What Oxitec is doing on mosquitoes in places like Brazil, for example, is the former. You could argue that that is a slightly more reassuring technology than releasing genes.

Viscount Ridley: That was what they wanted to do with the olive fly in Spain and they gave up. They said it was impossible.

Mr Eustice: I would hope that now we have this new approach and the ability to gain approval Europe-wide but for individual nation states to have the ability to opt out, there will be less of an incentive for those member states to muddy the water, throw spanners in the works and play for time. The jury is out. It is now two years since the maize strain 1507, where we worked very hard with Spain to get to the process of this deadlock where there was no QMV either way, but still we are waiting for the Commission to do what it now has the power to do, which is to actually authorise its use.

Baroness Neville-Jones: Is there a test case forthcoming? Presumably somebody needs to do something to cause the Commission to respond? Is it going to respond otherwise? I cannot see what it would respond to. Is this actually in the pipeline?

Mr Eustice: As I understand it, the ball is in the Commission's court when it comes to the maize strain of 1507 in that in two years there has been no QMV to block it or authorise it. In such a deadlock situation, the power rests with the Commission.

Baroness Neville-Jones: So you are saying that there is an unfinished process?

Mr Eustice: That is right. It is unclear why the Commission has not yet exercised the power that it has, particularly given that we now have the national derogation in place. Initially it might have thought, "Let's get the national derogation in place before we do it". The danger with all these things is that if you leave it too long, people start to say, "Ah well, the evidence on which this is based is a bit out of date, so maybe we need to go back and start again", and you end up in a sort of Never Never Land if you are not careful. I am not aware at the moment that we have had any applications to do field trials on insects. I know that in the US, for instance, there are trials under way for the diamondback moth, which is also a common pest of brassicas in the UK.

Mr Freeman: As well as the pressure from applicants, the danger is that the appetite of applicants reduces if the regulatory framework is the wrong way. The other pressure is economic, and my message to the Commission on Monday will be that Oxitec is a very good example but that there is a far bigger one, BASF, the global German industrial major, which wants to shift from chemical agriculture leadership to biological crop protection in the 21st century and is announcing that it is leaving Germany and Europe with its agriculture division to go to the US. That is a very profound wake-up call. If Europe is serious about generating an innovation economy, and Commissioner Moedas has admirably set out that it is, my argument will be that you need a regulatory framework strategically that encourages commercial application as well as academic research.

Baroness Neville-Jones: So where does the German Government stand when something like that happens?

Mr Freeman: I think it is fair to say that it is a complex coalition of interests. George, as a Defra Minister, leads on more of those negotiations.

The Chairman: I think it is better if we ask you about the British Government rather than the German Government.

Q78 Lord Peston: My question follows Lord Ridley's question. I am very confused by your answer. If we carry out the thought experiment that our scientists have cracked the theory and the application side of GM insects, is there European involvement then as to whether we can proceed further? Is there any basis for Europe stopping us exporting all this technology to the countries that need it? I am very pro Europe, but I do not see any European interest, us having solved the problem, in our getting it applied.

Mr Eustice: I think you are right. I ought just to clarify that when it comes to our doing trial work and field trials, that is a national decision and we do not have to get the agreement of other European countries. If we decided that we then wanted to export that technology from a UK science base to Brazil, for instance, or to the Cayman Islands or Indonesia, or other countries that are open to this technology, there is nothing to stop us doing it; we just have to satisfy the regulatory regimes of those individual countries. Brazil, for instance, has quite a permissive approach to this and has embraced it. If we wanted to commercialise these techniques, GM insects for use in the European Union, we would have to go through that European authorisation process.

Lord Peston: Viewing it as an aid problem—namely that we want to help the countries of sub-Saharan Africa, which I hope we do, I hope you will confirm that we do—there is no European angle to this at all, is there?

Mr Eustice: No.

Lord Peston: It is only if we wanted to save lives in Europe that we might be told, "No way".

Mr Eustice: That is right. In fact, a more likely application in Europe might for instance be to control midges to prevent the spread of animal diseases, such as bluetongue, or indeed to deal with certain insect pests, such as caterpillars from the diamondback moth.

Mr Freeman: To take research from the deep academic lab through to field applications, most companies will want to do that. Even if they are free to do that field research in the UK, if there is no UK or European likelihood of that technology being put to use in that agricultural system we are likely to become a place where you do the very advanced deep science but all the translational science and the product development is likely to go into a territory where the products are actually being used.

Lord Peston: In other words, sub-Saharan Africa.

Mr Freeman: Outside the UK.

Q79 Lord Fox: Turning slightly aside from regulation, which I am sure we will return to in a minute, Mr Freeman, on the subject of the BIS view of strictly the insect part of what we are talking about here, how commercial is this? We have heard differing views from witnesses as to whether this is even a commercial possibility or is this really, as Lord Peston inferred, about international development and international help?

Mr Freeman: As George has just highlighted, there are no applications at the moment for the use of that technology in the UK. As the previous question highlighted, there are enormous international opportunities in Brazil and other tropical economies. In the UK, through BBSRC and Innovate UK, we supported Oxitec specifically. Innovate UK is supporting

a sustainable dengue prevention programme. There is DfID funding. Imperial College is working with Gates and the European Research Council. The Synthetic Biology Leadership Council is looking at how we can use and develop our leadership in these technologies. If you look at the pace of growth in agricultural technology—I have come this morning from the World Agri-Tech Investment Summit here in London—in 2013 the total figure raised globally was £0.5 billion; this year we are on track for £4 billion. This sector is rapidly developing, huge volumes of money are coming in, and it is a big opportunity for the UK science base.

Lord Fox: So BIS does view this as an important commercial opportunity?

Mr Freeman: Yes, globally. As I say, at the moment there are no applications for GM insects in UK agriculture, but globally we see a huge opportunity.

Q80 Baroness Morgan of Huyton: We have had evidence from Oxitec, and it is a bit depressing on one level that it was taken over by an American company, so our British flagship has been taken over. Is there anything else in particular that BIS should be doing, not so much to support the research, which is clearly strong—we have had clear evidence about that—but to support development and commercialisation more? We had something of a hint from Innovate UK that we should do more. What is your response to that? Clearly we are well placed to do this, but there is something missing in the system.

Mr Freeman: There are three responses. First, on the takeover, you have heard evidence from Oxitec. I think it would argue that it was not a hostile takeover but that it was in Oxitec's interests, that the American company is a technology partner and that will help Oxitec to globalise that technology. In these science and technology sectors, those global collaborations are viewed as a success.

Baroness Morgan of Huyton: It is just a bit sad when the one British flagship goes. I recognise that it is still employing people.

Mr Freeman: In relation to support for emerging companies—this is really what the agri-tech strategy is about—we have set out a 10-year vision of how we can harness our agricultural science and technology base, which is not inconsiderable at £0.5 billion a year. If you asked the industry, they would have reduced that figure by a very large sum. They were not aware of how much we were spending. Through the leadership council the sector has come together to help us identify long-term priorities. We have launched a catalyst fund for agricultural innovations: 100 projects funded, £50 million across the UK. Last week, the two of us opened the UK Centre for Agri-Informatics and Metrics of Sustainability, which is pulling together all the data on field cropping and agronomy and genomics to help drive insights into new technologies. I think we are supporting the landscape. Through the Synthetic Biology Leadership Council, which I chair, we are actively both funding and providing leadership of the sector. There is an international market that we are determined to go after.

On the regulatory discussion, which Defra leads, I am signalling on Monday more broadly that in the bioeconomy we need a benign framework. On GM, the painfully negotiated settlement, which does open up derogation and derogated powers, allows us to begin to catch up and make sure that we in the UK do not get left behind.

Baroness Morgan of Huyton: Have you any thoughts about how the range of possibilities that you are describing and the range of investments at the moment can be encouraged to

scale up? We have seen in a lot of other tech areas that we are brilliant at the bottom, we are brilliant at the first stage, and then we are not so good at the next stage.

Mr Freeman: This goes back to the previous question about how important it is that we have licence and regulation for use in our own agriculture. That is also the issue in biomedicine, as Lord Kakkar is well aware: if the NHS is a slow adopter of innovation, we are a great place to do the research but not such a great place to commercialise. Unless we are also a good economy for using innovation, putting it to work and testing it in the field, we are in danger of being simply a good place to do research but the commercialisation will go elsewhere. That argument writ large confronts the European Union on an even bigger scale.

Q81 Lord Kakkar: The Minister has answered my question specifically, but just to be clear for the record of our report, it is an important potential disincentive to those who want to invest and develop these technologies that the ability to test them in the field and then apply them commercially is not facilitated through the European approach to regulation at the moment.

Mr Freeman: Absolutely right. The best example of that is the blight-resistant potato that has been bred. Your Committee will know that the average potato crop has between 10 to 15 sprays annually of fungicides—George will correct me if I am wrong—to prevent blight. The blight-resistant potato will not need those sprays. That is 15 expensive applications of chemical. That is a huge breakthrough, but BASF, which has been sponsoring the research in Norwich, has decided the likelihood of getting clearance in Europe is so slim that they have decided to focus elsewhere in the world. The derogations that we have negotiated will help, but BASF has already announced that it is moving. We are catching up. I think that speaks to the volume of the disinvestment that we need to deal with.

Lord Hunt of Chesterton: Can I just comment on that? There are other research councils; we have telescopes in Hawaii. There is nothing to stop research councils having projects in other countries around the world. At the moment probably all our biological agri is in the UK, but if there are difficulties, and speed is of the essence, presumably we could go to overseas institutes. Is that being considered?

Mr Freeman: It is. That is partly why we built DfID into the agri-tech strategy: because it is fundamentally about those global markets. Historically, the UK, as you well know, has led the world in tropical agriculture. There is still an institute in Nairobi and there are institutes all around the world.

Lord Hunt of Chesterton: Do you have a budget to do this? How will the budget appear for this activity?

Mr Freeman: DfID has signalled active enthusiasm for exporting agri-tech technologies into developing countries around the world, and that is part of what the agri-tech strategy is about.

The Chairman: Mr Eustice, you wanted to come in?

Mr Eustice: I just wanted to re-emphasise what I said at the start. The issue is not so much the regulatory process as written in the European Union but the way it is implemented. All the EU has to do is not necessarily rewrite its process but just gain some credibility by sticking to the process that it has written down. That is when there is a huge lack of confidence in the industry, when they see that they are going to get stuck in the morass and

nothing will happen. If the EU could get to the stage where it can demonstrate that it can move from the beginning of the authorisation process for commercialisation to the end in, say, a nine-month window, which ought to be eminently doable in uncontroversial cases, then you start to get back the confidence of industry.

Lord Vallance of Tummel: For BASF, which is a multinational that will have infrastructure around the world, not having a home market in Europe is something you can get over, but if you are a start-up in the UK, or another European Union company, not having a home market is a major problem.

Mr Freeman: Yes.

Baroness Neville-Jones: I wanted to come back to something you said, Mr Eustice, which is that the theory that European assessment is okay but it is the way it is conducted. We have heard other witnesses say that there is a problem with the methodology itself in that it does not really allow consideration of the benefit, it is all on the risk side, and that that queers the pitch in a sense. It clearly gives those who want to block something an added advantage if you can constantly create a climate of extreme risk aversion. Is there some merit in trying to get the process itself modified so that benefit, which after all has real economic implications, has more of a hearing?

Mr Eustice: I know I have heard that argument. If I am honest, I am less persuaded by it for a number of reasons. First of all, if what we were seeing was member states saying, "We don't think this is safe", or, "The risks are too great", or EFSA carrying out analyses and saying, "This is a bit risky", then you might say, "Well, maybe they're not taking full account of the benefits". The evidence is that even when they are saying, "This isn't risky. We're absolutely satisfied that this is safe", member states are still saying, "Ah well, we don't agree with that science". The problem you have is not that on a precautionary approach to the evidence you risk coming up with a no answer too many times; the problem is that even when you have a precautionary approach and people are telling you there is no risk based on the science, politics and political obstacles get in the way. My argument would be if the problem is a political barrier and an overly cautious political culture, to say that we are just going to balance the risk against benefits does not do much to reassure that problem.

Baroness Neville-Jones: You are really saying an improved procedure does not actually solve the real problem?

Mr Eustice: I do not think it does. It is just about sticking to the procedure that they have, and there are way too many delaying tactics.

Q82 Lord Krebs: My question follows on from the discussion of regulation. You will understand from what you have heard that we have been impressed by the amount of written and oral evidence that we have had that the current regulatory environment is not fit for purpose. Baroness Neville-Jones has just addressed the question of whether it is the regulation or the implementation. We have covered quite a lot of this. I just want to pick up on the particular aspect that both Ministers have referred to, which is the relatively recent derogation to enable member states to opt out if they wish to. I wondered if you would agree that this makes things even worse in some ways, because the opt-out does not have to follow any scientific evidence. As I understand it, member states can say, "Okay, here's the evidence, the science says it's all fine"—this is essentially what you just said, Mr Eustice—but for other reasons, such as, "We feel frightened of it", or, "We don't like the look of it",

or, “We want to grow organic crops next door, we will opt out”. Surely in terms of the overall perception of Europe as a place to do research and business related to genetically modified products, including GM insects, this sends the message that Europe is a confusing place, because some people are prepared to ignore science and go for emotion, and Europe says, “That’s fine, we’ll reject things on the basis of emotion, because we don’t think the science is good enough”. Do you not think it makes it worse rather than better?

Mr Eustice: I understand the point, the UK’s position being that we should have a science-based approach and to assess the risk. You are right on one level that having a derogation that enables member states to say, “We’re not having this anyway, notwithstanding the science”, does send that signal. We have been deadlocked and going round in circles on this for the best part of 20 years, getting nowhere fast. Europe is always a place of compromises and fudges and muddles, and sometimes it is the only way to break out of a deadlock and get progress. If the 10 or so member states that want to have the option of using these can do so under this compromise, that is a step forward. It may be that over time other countries will come on board.

I understand that Holland has signalled at the moment that they would like to exercise their national derogation to opt out, but interestingly it has have not ruled out cultivating. It just wants an additional national filter on each application as it comes. A lot of the other countries that are currently saying that they will opt out might just want an extra layer of national filter before they will give it the go. Maybe over time, suspicion of this technology will dissipate and we will start to see progress.

Lord Krebs: Is the maths at the moment, from what you have just said, that about a third of the member states would want to ahead with GM technology and nearly two-thirds would want to use the derogation clause?

Mr Eustice: Yes. It is a complicated picture because they have also allowed regions within member states to opt out. From the latest figures I saw—my officials will correct me—19 member states have so far signalled that they want to opt out and the remaining nine say they want to opt in. We have said that we want to opt in, but Scotland, Northern Ireland and Wales have each said they intend to have the ability to opt out. I think Flanders has also signalled that it wants to opt in, even though the rest of Belgium is opting out. It is a complex picture. Broadly, a third versus two-thirds is about right.

Mr Freeman: I think Lord Krebs made a really important point that what we are witnessing here is some very non-science-based political objections to proven science and technology leading to serious fractures of the single market. It is inelegant, and I think we are both saying that it is not the ideal position; we would much rather have a European single market and the principles of a European economy unleashed to drive European leadership in this. This is a way of protecting the UK’s ability to do our bit for global agriculture, but it is not ideal. My message to the Commission on Monday will be that this is a very serious fault-line that is not good for Europe and not good for our reputation as a single market leading in these innovative areas.

Lord Maxton: With all due respect, there are political objections, but politicians only object if they are driven by other forces. What are those other forces that are driving some parts of Europe to reject the scientific base?

Mr Freeman: There is a range of them. It is complex. I looked at this before becoming a Minister when I wrote a report on EU regulation of the bioeconomy and bioscience. I would not claim to be an expert by any means. It was clear that one of the factors is that, because of the way the European decision-making and policy-making structure is set up, those who get early influence in the corridors can have a very disproportionate influence. Often the companies, particularly in new sectors, are not busy in the corridors of the legislature or the Commission and are often in receipt of things coming their way that they were not aware of.

Secondly, the economic crisis in Europe, which has triggered a very visible political backlash and the rise of a lot of anti-business, big business, big government, has an anti-big science element, so some of the coalitions that have been formed with some of the nationalist minor parties across Europe have a noticeable vein of anti-science and anti-big business that has been quite profoundly influential. There are also other historical, cultural and religious influences across Europe, which have been there since time immemorial. It speaks to the earlier questions the Committee asked about the importance of science-led evidence-based policy-making.

Q83 Lord Patel: My question follows on from Lord Krebs's question and is still related to regulation. Some of the evidence that we have heard suggested that the regulatory environment for GM insect technologies could be improved by including consideration of benefits and moving on to a trait-based system. Do you think that might be helpful, or will it further confuse?

Mr Eustice: I covered the benefits earlier in the answer to Baroness Neville-Jones.

Lord Patel: Yes, you did.

Mr Eustice: People sometimes cite this in the context of Canada, which has a regime that looks at traits. I think it is wrong to conclude from that that it is necessarily the right approach. It just means Canada is obviously a single independent nation state that can make these decisions on its own and has things much easier. My concern about traits is first of all that with any European process you always have to be conscious that by taking the lid off things and trying to play around with the wiring, you might end up with something worse. It is a terrible thing to say, but I am afraid there is a track record of trying to tamper with things in Europe that are not quite right, and they end up worse than ever.

Lord Patel: That sounds as though you go for a compromise.

Mr Eustice: The point I would make is that there is a reason why I think we should be a bit concerned about switching to a trait-based approach, and that is that the Commission is currently considering whether other novel breeding techniques, such as cisgenics and gene editing, should be covered by GM legislation. Our view is that they should not, because this is about moving genes within species; it is not about moving them between species. We would not want those to be treated as GM, otherwise you are going to hold back the development of a very exciting new area, modern gene techniques, that has its genesis, if you like, and is still rooted in conventional techniques. We have used irradiation and things like that to get gene mutation for many, many years. I think they are closer to conventional techniques than GM, and we want to try to protect that distinction. Once you start talking about trait-based approaches to this, I think there is a danger that you start to tip some of those other novel techniques too closely to the GM regulatory regime, which is the worst of all worlds, because then you have other exciting new technologies that we hope to protect

from this and to maintain an understanding that they are not GM, and get muddled up in this unsatisfactory regime as well.

Mr Freeman: I would strongly echo that. There are companies in the UK in agricultural breeding that have set themselves out as not GM, they do not do GM technologies, but they are actively investing in traits and a whole range of non-GM technologies for accelerating naturally occurring traits. It would be a disaster if we lumped them into the GMO regulations, which are very specific and intended to cover a very particular intervention.

Q84 Lord Cameron of Dillington: George Eustice, you were saying that political influence overcomes the scientifically stated absence of risk, and therefore that benefits are not relevant. Taking up Lord Maxton's point, if benefits were very much part of the process, I think the politics could easily change, as they do for instance in health, where you get genetic modification of antibiotic clusters and the people's general reaction is, "Go for it. What are you waiting for?". It does not seem to be the same in agriculture. Perhaps if we highlighted some of the benefits—the GM potatoes that George Freeman mentioned are a very good example—we could make a difference.

Mr Eustice: I suppose this is about the point at which you argue the benefits. I take your point. If after EFSA has done its risk assessment and told everybody that even on the precautionary approach it is safe, and then it gets to the point at which there is a vote in Council on QMV, that is time to say, "It's safe and, do you know what, there are some really good benefits here that we should not turn our back on". I completely accept that that is the point.

Lord Cameron of Dillington: If the benefits were recognised as part of the earlier process, they would come to that, it seems to me, so the Austrians, who are probably the most fervently anti-GM, might see the benefits of not spraying potatoes.

Mr Eustice: I suppose my preference would be to be able to say, "It is absolutely safe and it has been independently assessed as so and, do you know what, there are benefits here".

Lord Cameron of Dillington: But you are just a politician.

Mr Eustice: You are right. The science can be there, but effectively to compromise a risk assessment by trying to introduce a notion of benefits alongside it probably does not help to reassure people. That is not to say that you cannot emphasise the benefits once you have demonstrated it is safe. Does that make sense?

Lord Fox: Coming straight to that and emphasising the benefits, there is no public debate at the moment on insects. Should there be? Who should be helping to lead and steer that public debate?

Mr Eustice: We do not have any applications even for trials in the UK—this is a very early technology—so I am not sure that there is a case for a big national debate until there is something that we are willing or able to start bringing forward and consider commercialising. My understanding, talking to some of the other companies involved in GM, is that public opinion on GM has somewhat mellowed over the last 20 years. There is still a caution and an apprehension about this technology, but there is more openness to it than there was 20 years ago when the idea was first mooted. If you explain the benefits of it and reassure people about its safety, the consumers are more open to it than perhaps many presume.

Lord Peston: For the second time in your evidence session I am totally bewildered. I thought the Government's position on Europe was that we should be able to opt out of everything; we want a Europe where a country decides solely for itself what it wants to accept or not. What is the difference? Supposing we were told, "If you want to be in Europe you've got to be in the single currency", you might well scream the place down. What is the difference between that and a genetically modified potato?

Mr Eustice: It is precisely for that reason that we were comfortable with a national opt-out on the point of cultivation to get progress. We would prefer it if all other countries had an evidence-based approach as well, and that is what we have argued for, but where we draw the line—

Lord Peston: Sorry, just to interrupt you, it is not to do with an evidence-based approach. If you believe in a free market, and I speak as an economist, you believe in a free market. "The genetically modified potato exists, it has not been shown to be damaging, end of story", would be how Adam Smith would argue it.

Mr Freeman*:* If you go back and read the Prime Minister's seminal speech setting out our position on Europe, absolutely central to it was the urgency of Europe embracing a more entrepreneurial, more innovative economic model.

Lord Peston: We agree with all that.

Mr Freeman: I think this fits perfectly with trying to make sure that it focuses more on unleashing its economic potential for the benefit of its citizens and the globe, and less on this drive for ever-closer political union and ever greater regulation. We want a Europe that is ideally a single market of evidence-based support for the bioeconomy, but we want a Europe that is looking actively at how it can unleash its power globally in the bioeconomy.

Lord Peston: So you would reject all those economists who say that the single currency is the best way to get exactly the economy that you have just described?

Mr Eustice: Yes, I would reject that.

Lord Peston: All the economists are wrong.

Mr Eustice: Yes, the economists who advocated British membership of the euro were all proved wrong in the event, and I say that as someone who was involved closely in that debate.

The Chairman: We are moving away from GM insects.

Lord Peston: My interest is in genetically modified potatoes. I find it amazing that you should be able to opt out of genetically modified potatoes.

Q85 Lord Hunt of Chesterton: I have a couple of questions to do with public dialogue. I think your position was something that we have heard before: that the situation is not necessarily ripe for having a large public debate on this issue, because there are a lot of technical issues. One of the issues of the public perception of this is the name. Indeed, the House of Commons Science and Technology Committee strongly suggested a change of name for this, rather than using "GM". I have forgotten the word they used.

The other point you made was that some businesses regard public sensitivity towards GM as becoming easier. Presumably this is partly because in Europe most animal feed is now using

GM animal feed imported from the United States. There is a huge level of GM. Is this something that you publicise or explain? What is the role of Brussels, since we have a lot of GM as part of the business?

One more small point. A lot of the euro debate is that this is big private enterprise making its decisions, but in fact the European Community has its own European laboratories, and for some people if you have government laboratories that is a way of ensuring safety as opposed to just academics and business. Do you feel that the role of these state laboratories and institutions should be raised in profile as a form of giving safety? Not everybody believes that, but a lot of people feel that if it is a state-run organisation there is a level of security and long-term safety. What is your view?

Mr Freeman: Perhaps I will start on the public dialogue about science issues, and then George and Defra can lead on the feed issue. Lord Cameron made the point earlier about the striking difference between the debate about genetics in the context of healthcare and the debate in the context of agriculture. I think healthcare has led the way and that we have a very good system whereby the Government receives high-level scientific advice from both the chief scientists from the office of the chief scientist and from ethical advisory councils.

On the genetics of embryo research, our system works well, the Government get a piece of advice that new science and technology is making things possible, and Parliament needs to debate these, we need a consensus and we need a steer from Government. You have seen a number of debates in the last few years in the House. There is something in that. On healthcare I do not hear a great public outrage that our system for regulating genetics in healthcare is inappropriate. In fact, most people would cite the UK as leading in it. I think there is a lesson for a wider application of genetics there.

On the wider question of debate, who could not be in favour of debate as long as it is well informed? The GM debate has been characteristically ill informed. That is partly a function of all sorts of complex issues. The House of Commons is rather less good than your Lordships' House at debating science. There are not many people in the Commons with experience of science. Food is much more emotional in some ways than medicine. There are differences. It is important that we try and rebalance the debate. I would just point out that when somebody like Mark Lynas, who was a major spokesperson for the anti-GM movement, switches not slightly but 180 degrees and says that the previous things he said were completely undefendable and wrong, that is a big wake-up call to all of us that this debate needs to be rebooted. The benefits point is crucial. When we explain to people that genetics in agriculture, whether it is insects or crops, has the potential to allow us to grow crops in areas where they are currently not able to grow—drought-resistant crops in the Horn of Africa, disease-resistant crops that do not need spraying in the same way that can reduce the cost and the environmental impact, that can help emerging economies—the debate changes profoundly. There is an interesting question about how we in the UK could use our science advisory infrastructure to help change that. I suspect that the worst people to lead the debate are the companies doing the research and the politicians doing the regulation. I think it needs to be led by food consumers, by environmentalists. Mark Lynas and people like him, who have been very close to the debate, have a very big role to play.

Mr Eustice: I think you make a very good point on GM feed. I know that some of you from this room attended an APPG meeting last week, which looked at the issue of the Commission's current GM feed proposal. It is fair to say that there is a huge amount of

frustration in the Commission at the moment. Commissioner Andriukaitis, who leads on this, is pretty much laying down the gauntlet to member states and saying, "If you are going to keep voting against applications that we have for GM animal feed coming into the European market, then have your opt-out and do not use it". The reality is that all but one member state in the European Union are heavily reliant on GM soy coming into the European Union, and their livestock industries would be massively compromised if they were not able to use it. There is a lot of frustration in the Commission that it sometimes suits some member states to vote against these things, blame the Commission for forcing it on them and look as though they have done their best to their domestic audience, while actually being perhaps a bit hypocritical in that they are voting against something which they know in their hearts they would not take up if they were given the option. There is an argument going on about that at the moment, and we suspect that the GM feed proposal is not going anywhere fast because the European Parliament has expressed concerns about it and there is no support in the Council, so it is probably not going anywhere. I think the fact that it was brought forward—

Lord Hunt of Chesterton: When you say that it is not going anywhere, are you just going to carry on having GM feed in use?

Mr Eustice: Yes, GM feed will continue to be used and there will probably be no national derogation as things stand. Having had a lot of negative reaction both from the Council and the Parliament, it looks as though it will not go anywhere. I think that in some ways it was brought forward by the Commission perhaps for tactical reasons to try to get countries to face the reality that they are buying and heavily reliant on GM feed for their livestock industries.

Mr Freeman: I would just make the point that if we were going to have a public discourse about GM modified insects, we would need to be able to explain to people that there is a difference between population suppression and population replacement; that there are pros and cons of both. Where you have a vector like the mosquito—although people may think it provides absolutely no value to society at all, there is evidence that it does important pollination functions—you may not want to suppress the population but to follow a replacement model so that it is still an effective pollinator but not in a vector of disease. I think the debate would need to be informed by some clear science, and Parliament and the Office of Science and Technology have a role in making sure that public discourse is properly informed.

Lord Hennessy of Nympsfield: When it comes to public discourse—I speak as an old journalist—the scare story will always trump the benefits story. There is a great pool of existing neuralgia with the words "genetically modified", as Lord Hunt was saying, as there is with "nuclear". It only takes one scare story and the whole terms of the debate, the terms of trade as it were, informed or not, change. You live with that as politicians, but there it is, that is the reality. Listening to all this is fascinating, but I get a great sense of fragility about this question, because it only takes one run of particular stories and evidence-based rebuttal can never quite catch up. We are on a precipice—mixing my metaphors—on this, are we not?

Mr Freeman: If one was starting with a blank piece of paper and asking how we could maximise the UK's potential to put our science and innovation to work for global good, you would not start from this point with deep public confusion and fear about those initials

"GM". Notwithstanding the fact that somebody like Mark Lynas says that the debate is completely skewed and needs to be revisited, we are in a bad place to start. That is just the fact of where we are. The more scientific advice and evidence and the more we can initiate debates in Parliament with a process that says, "Here is the issue. You do not need to debate the facts. This is the choice. This is what is going on at the moment. The public policy debate is should we do X or Y", the more one can frame the problem, the solution and the benefits, the more politicians have a chance to have a better debate.

The Chairman: The final question from Lord Patel.

Q86 Lord Patel: My question is about exploring the state of the science. For instance, the United States' National Academy of Sciences has set up a committee to look at the state of the science in technology such as gene drive, gene editing, using other gene-slicing technology. They hope that this will then inform them about what kind of regulatory framework they should build. Do you think we should do a similar exercise? If so, who should be responsible for doing it?

Mr Eustice: It is an interesting question. In the case of commercialisation, while we have a process that is driven at a European level we are always going to be coming back to the art of the possible and what can we agree with 27 other member states. That is always going to be the nature of it. As I said at the beginning, I do not think there is much wrong with the process that the EU has as written. It all comes down to the implementation, and that is the bit that we have to get right.

Lord Patel: We have talked a lot about the regulatory framework in Europe and who should inform it. The US National Academy of Sciences has taken a different route and said, "Let us set up a committee and carry out a study of where the science is going to go and therefore what the appropriate regulatory framework will be".

Mr Freeman: In the UK we have a parallel system. The chief scientist, the office of the chief scientist, advises the Government periodically on issues that have been thrown up by the pace of science and technology and by developments in science and technology that might create opportunities for the UK. Indeed, I have spoken with him this week about this subject. Your inquiry has already triggered some of those conversations. Chief scientists in each department have a duty to signal opportunities in that department and the chief scientists grouped together signal to Government periodically when there are opportunities. In the Department for Business, Innovation and Skills we are actively looking at areas where there are opportunities for the UK in science. As I say, we have set up the Synthetic Biology Leadership Council to advise on this broad field. We have channels of advice making sure that we are aware of areas of opportunity. The issue really is how we make sure that Parliament is able to initiate debates that are properly focused on the public policy questions that are legitimately in front of us.

Lord Patel: So you are relying on the government advisers to advise you? Might it be better if an independent, external, professionally respected academy were to be advising the Government on where the science is and therefore the regulatory framework?

Mr Freeman: That is a very interesting idea. I would be delighted to follow it up with you and have a look at the American model and see whether there are lessons for us.

The Chairman: I think that on that note we should conclude the session. We have taken a lot of your time. You have drawn attention to the need to have an informed debate, and I hope

that when our report is published it will indeed help that process, both in Parliament and out. Thank you very much indeed for having helped us so much this morning.