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COLLEGE OF ST GEORGE

ST GEORGE'S HOUSE

GM Technology: Significance for UK Food and Farming

Wednesday 25th February
to Thursday 26th February 2009

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CONSULTATION

ST GEORGE'S HOUSE

St George's House is a residential Study Centre within Windsor Castle and forms a part of the 14th-century foundation of the College of St George with its heart still today in St George's Chapel. The tradition of study extends over six hundred years on this site since King Edward III established the College in 1348. Later, Queen Elizabeth I ordered the members of the College to add learning to their existing duties of prayer and worship.

The present St George's House was established in 1966 under the joint initiative of His Royal Highness The Duke of Edinburgh and the then Dean of Windsor, to continue the tradition of learning in this ancient setting.

The purpose of the House is to explore with men and women of responsibility and influence a range of issues of current concern, with almost no limit to their substance – scientific, political, economic, industrial or social. Above all it hopes that, in whatever ways, its proceedings can effect change and generate wider understanding. Most of the Consultations extend over one or two days and many have an international flavour.

The House also has Consultations mounted by outside groups and organisations seeking to explore their own issues, in an ambience which beside being historical and dignified also facilitates private discussion in privileged surroundings. Topics explored in recent such Consultations include interfaith and intercultural cooperation; politics and the media; the role of religion in public life; the AIDS crisis; aspects of Higher Education; the environment (including Farming); and issues related to leadership, and to ethics. The House also organises conferences and courses for clergy.

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FOREWORD

The Reverend Canon Dr Hueston Finlay

Warden of St George's House

This booklet contains a report of the proceedings of a St George's House Consultation, held in February 2009, on GM Technology: Significance for UK Food and Farming.

The Consultation was the seventh in a series, initiated in 2000, on The Future of Farming. Highly topical issues have been analysed in successive Consultations, including among others the environmental and social costs of industrialised agriculture; agriculture support and world trade; the relationship between producers, distributors (including supermarkets), and the consumer; and career prospects for the rising generation of farmers. The series has acquired its own internal dynamic, each event identifying new ideas which, by common consent of the participants, deserve to be the focus of another Consultation.

Throughout the series, the guiding spirits have been Sir Don Curry (Chair, Policy Commission for the Future of Farming and Food) and The Revd Professor David Atkinson (formerly of the Scottish College of Agriculture). We have been especially indebted to Mr Richard Carden, recently made a Fellow of St George's House, for his help and guidance in this Consultation. His commitment, knowledge and expertise in this field, have helped us throughout all the planning stages. We are ever grateful to all these gentlemen for their ideas, their energy and their consistent support.

As on previous occasions, the latest Consultation brought together farmers, academics and researchers, representatives of concerned NGOs, and businessmen and officials. Discussion was lively, well-informed, challenging and imaginative, and benefitted from stimulating inputs from a range of distinguished experts. In accordance with the St George's House Ethos, confidentiality was preserved and this report does not attribute ideas to individuals.

On behalf of St George's House, I would like to thank all those who contributed to a successful and productive Consultation: the organisers and participants, Dr Katharine Scarfe Beckett, who prepared the report, Sue Pendry, who administered the event with her customary dedication, and our sponsors, Defra, Tate and Lyle PLC, The Crown Estate and The Frank Parkinson Trust, whose generosity made possible both the Consultation and the present publication.

St George's House, Windsor Castle

GM Technology: Significance for UK Food and Farming

Convened by Richard Carden

Chaired by David Atkinson

Report by Katharine Scarfe Beckett

Wednesday 25th to Thursday 26th February 2009

As it is ...

GM has come to represent very **different needs, threats and aspirations** for us as farmers, land managers, ecologists, scientists, food distributors and retailers, environmentalists, seed marketers, government officials, representatives of NGOs or consumer interest groups and members of the general public.

It's easy for *any* position on GM to be misrepresented, for the sake of dispute, as one or another polarised and dangerous self-interest. However, **'business as usual' won't take care of food security**. Furthermore, UK **consumer concerns about food have shifted**.

Is it perhaps **time to revisit GM**?

Shadows of the past

Ten years ago, GM hit the headlines as a **new commercial food technology** while public confidence in agricultural science was flailing in the wake of BSE. Public opinion in the UK on the subject came down decisively **'no'**.

Since then, the UK public seems to think GM has been relegated to the **status of a non-issue** in a rightfully conservative, well-labelled food-chain whose safety is assured.

As industry (and others) see it, GM was **not explained clearly or aptly** for consumer concerns at the time. Though we are now as much engaged with **food *security*** as with food safety, there remain **misunderstandings** or **bad feelings** about GM alongside deep continuing concerns: some feel a sense of **inherent 'wrongness'** about the technology itself, others **distrust** what's visible of its approaches, governance and goals.

New institutions such as the Science Media Centre and the Food Standards Agency (FSA) may have helped smooth the way for new debate. **Media** presentations seem more discursive and descriptive, less polarised and alarmist. People now generally trust the integrity of the UK's **food regulatory processes**.

Consumers are interested in direct benefits from healthier, cheaper or more ethical food products. They will see point in **higher yields** for farmers so far as those contribute to an

overarching public good. But industry promotion of GM for yield-increase might again be seen as a **profit motive** that discredits the technological benefits.

Is that a digger which I see before me?

'**Multifunction farms**' must **feed the world**, advance **sustainability**, meet **food safety** requirements, stimulate the growth of **countryside economies**, maintain the **pastoral ideal** and still enhance **rural livelihoods**, especially where farming is central to the **GDP**.

Although **we have sufficient food to go round**, the social benefits of modern food production are **unevenly spread** – while the **effects on the environment** have been largely **adverse**. Although consumers are reconnecting with farms, many people still seem to think that their **food grows on a shelf**.

In fifty years, the global population is expected to number some **nine billion**, by which time our **food and water needs** will have doubled. Rising temperatures and the extreme weather conditions of climate change, including **flood and drought,** will damage crops also attacked by new (or more) **disease and pests**. **Land** to grow more food on will be scarcer (from drought, salination, erosion, growth of non-food crops, etc). **More meat and dairy** in a larger number of diets will mean that grazing space (and methane) must increase. Will **foreign imports** under laxer rules still come in cheap? **Water quality** will tend to fall (run-off, nitrates, herbicides and such) while many will continue to think clean water is a right: how long can that continue? **EU regulations** will tend to multiply and, with **oil ever scarcer**, **costs can only get higher**.

Input must decrease, and output rise. Who'd see the future through a farmer's eyes?

"It's life, GM ..."

GM crops currently grown worldwide are mostly **maize**, **soya**, **oilseed rape** and **cotton**. Main traits are **herbicide-tolerance** and **insect-resistance**, increasingly 'stacked' in the same crop. Eight or fewer **big seed companies** dominate GM property rights and biosafety controls especially in the developing world.

GM crops can deliver higher yields as promised (when managed as advised). Overall, farmers (and, in principle, consumers) should have enjoyed an economic advantage.

The Americas have taken to GM like ducks to water. The Asians are willing: a new GM rice may emerge soonish from India or China. Attitudes in Europe are mainly averse: France, Germany and Austria are very anti-, Spain more pro-. Bulgaria and Romania both grew GM crops before joining the EU; with EU entry, that has changed. England is pragmatically undecided on GM. The administrations in Scotland and Wales won't have it.

In **Europe**, **GM food crops are not grown**. The biofuel and food industries don't like the 'genetically modified' image, so European **GM agriculture is limited to animal feed** in the form of borer-resistant maize.

European shoppers in eight countries do buy **foods containing GM ingredients** – added

oils, starches, yeast, etc – with no great awareness of GM products as a presence on the supermarket shelf. UK retailers, highly aware of the **negative PR potential**, have accommodated GM products where unavoidable without embracing GM as such.

Proponents argue that we already use (and eat) GM products. 'Transgenics is unnatural?' Mules and triticale have long combined genes across species and **other biotech isn't 'natural'** either. 'Unknown ecological consequences?' Non-GM novel cultivars present **analogous risks** and there are many ways to deal with superweeds or loss of biodiversity. As for the 'concentration of power with global seed companies', well ... what's new?

"... but not as we know it."

GM **allows traits to be engineered more precisely** than conventional breeding – so, where government and infrastructure permit, it offers new tools to tackle farming problems that cannot at present be satisfactorily solved and which arguably ought to be fast-tracked because of the importance and urgency of **food security**.

GM phytoremediators could **scavenge pollutants**, or dissolved nitrogen; a GM grain could (in theory) **fix its own nitrogen**, or **tolerate drought or heat**. GM potatoes might **resist nematodes** better; GM wheat could **beat off orange-blossom midge**, etc. GM could help with **min-till**, improve **grain quality**, and **yield the same or better** for lower inputs.

Second- and third-generation GM crops align with consumer demands for **greener farming**, **higher nutritional value**, etc. GM is a **high-tech**, **high-value industry** that will serve the UK well in the global market in years to come.

GM **proponents say it delivers**. But has it? And *will* it? Where food-security is concerned, is our need greater for new forms of technology, or **new forms of behaviour**?

The **panoply of benefits** first promised for GM **has not been realised** so far. As a result, (often over-)enthusiastic promotion of new benefits to be realised by second- and third-generation GM meets with a **jaded response**.

Nature read in truth and lore

Some objections to GM are not 'scientific' – ie, not grounded in objective empirical methods as applied to material phenomena. But *are* **non-scientific values less relevant** to the quality of human existence? Many people feel they are well guided by their hearts as much as their heads and that scientific method is only one way of viewing the world.

To **dismiss arguments against GM** out of hand because they cite, for example, 'God's will, 'Creation', 'the natural order', 'evolutionary wisdom' or 'rights for DNA' smacks of '**sciencism**': a deep-held belief that science alone possesses useful truth.

The food *safety* of GMOs is likewise separable from **moral, ethical and cultural issues**. 'Substantial equivalence' of GM with non-GM foodstuffs doesn't accommodate **ideological objections to GM**. By analogy, the most nutritious and hygienically prepared pork is still unacceptable as food to someone who feels eating pigs is inherently wrong.

It's not always recognized or acknowledged by GM's advocates when unease about **GM itself is what causes others to draw back**. If moral or religious positions are interpreted as 'economic manoeuvres' or swept away as 'unscientific', **debate will derail** fast.

Productive topics for moving forward together might include **human stewardship** of the planet and partnerships to **solve finite and specific local challenges** in farming or food.

Do they know it's chromosome time?

An unexpected benefit of US bioethanol planting is that, deprived of artificially cheap 'food aid dumps', previously aid-dependent nations such as Mexico are moving towards **self-sufficient food production**. On the other hand, China now imports soya from Brazil to cater for the small but increasing percentage of the Chinese population that wishes to eat more meat. How will the **imports** – and the **rainforests** – look in thirty years' time?

Market forces will take care of human welfare only up to a point. Ultimately and bluntly, a **prerequisite for a viable economy** is a **population healthy enough to want to buy things**. As a cash economy tends to invalidate good solutions which lack a commercial edge, we want to add ledgers for **carbon, nitrogen and water economies**.

But **won't GM feed the world**? **Can't Europeans set a positive example** of GM use from which farmers in developing countries could learn and benefit? (Would direct **partnerships** between developing-world farmers and seed companies perhaps be preferable for the farmer, if less profitable for the latter?)

GM may offer solutions to some of the problems that dominate food production in developing countries. But GM products to date have demanded a commercial return which requires them to **fit developed-world criteria**. The moral argument that Europeans should embrace exemplary GM is pulled up short by expert opinions that **conventional science** could already **double or triple food production** in (say) Africa.

But that's about **finance**, **infrastructure**, **subsistence vs cash crops**, **distribution** and **efficiency** – not technology.

Transgenics B.O.G.O.F.

GM in the UK food-chain has three main strands: **animal feed**; **human food**; **whether to grow GM crops here or not**. Commerce currently highlights 'GM-free'. At the same time, it is recognised that shoppers will **rearrange choices around *compelling* benefits**.

Choice: 'If they buy it, they like it' is too simplistic. As consumers, we can be ambivalent. Our behaviour doesn't always reflect our sense, ethics and informed choice.

Safety: we mostly trust the regulatory processes and the food in the supermarkets.

Price: yes, we want best science and benefit (taste, storage) at lowest price; but ...

Value for money: in the UK, budgeting doesn't override ethics. We'll shop around for 'best-

value values'. (Lower-income shoppers have ethical aspirations, too.)

Health and nutrition: some see healthier food through GM as an opportunity.

Security of supply (potentially: agronomics, yield, storage): British consumers are concerned to protect crops against weather/disease; they have a sharp understanding of food security.

Commercial ethical impact of purchase (animal welfare, British, local, fair-trade): we judge governance, we ask '*cui bono*?' and we balance a number of values.

Environmental impact (local, British, climate change, low chemical input, organic): we believe that reduced chemical input and stronger, healthier crops are good outcomes.

Its natural term

A food brand-name is supposed to be reassuring, trustworthy and founded on earlier successes. We **may be stuck with 'GM'** now, but if so we must lend it **clarity and nuance** as one of many food-technology tools available, not the high-tech niche-market opportunity of the few. GM can result in **many outcomes** with **many different values**.

Consumers who oppose GM or lack technical knowledge are no less **sophisticated and sensitised** on the important topic of food than any other consumer. **Perception *is* reality** when addressing their concerns. All consumers are **apt to perceive and distrust** evangelism, over-enthusiasm, discrediting the opposition, condescension, vested interests and secretiveness.

Let's **ask smaller questions** – not 'GM: good or evil?' or 'Do you want GM or not?' Consumers should be presented with a **variety of risks, benefits and ethical concerns** to weigh up. True, **multi-strand arguments** are difficult and don't play well with the media – but **GM is not one topic** and single-issue, value-laden statements alienate people.

Makes antisense to me

Consumers do respond to questions depending on how you ask them, while also exerting their **common sense**. Public polls over the last ten years indicate that **we remain staunchly undecided** in the UK on GM. The fight will be for the middle ground.

The public like **talks by scientists** but, unfortunately, such talks don't forward a scientist's career. The media like playing two entrenched positions against each other but 'debate' is confusing when **few 'plain facts' remain uncontested**. EU/US political and economic disagreements over GM hinder consumer perception in some respects, but **consumers don't trust industry alone** to forward the public interest.

Most people have heard a **mixture of arguments** about GM, mostly from the citizenship perspective. They want **clarity, information and leadership** regarding the real issues. They are still not in a position to **evaluate a range of issues** when comparing (for example) meat fed on GM soya imports with maize that produces its own pest-repellant, or disease-resistant potatoes with laboratory onco-mice.

A new approach would be not so much 'public education' as **getting the public to make decisions** about what they want from food, and to establish a **hierarchy of worries**.

It's all in the risk

GM 'what-if' scenarios can swiftly race beyond debatable bounds. **Apocalyptic risks** can't be sensibly or honestly weighed against **utopian benefits**. Also, the **baseline** used for comparison alters risk-benefit ratios and outcomes from place to place. These problems characterize **risk-evaluations of non-GM** novel foods and organisms too.

Anyway, as soon as society gets involved it's **risk *management***. This means using the evidence base transparently and proportionately, case by case, honestly admitting gaps in the knowledge and not expecting people to take on more risk than they are prepared to.

We need to **agree the boundaries of acceptability** from the consumer perspective, so scientists know where to go with biotech. We must judge benefits and risks, as best we can, so as to **balance both locally**; consumers won't bear risk for the producer's benefit!

UK consumers currently **believe they don't eat GM** (they may not have considered their diet abroad). GM **pharmaceuticals** are probably acceptable because medicines are to correct a non-optimum physical condition. GM **biofuels** and **cotton** fibre generate less emotional and conservative response than GM food because they are not ingested.

GM in the human food-chain is different – and creeping in. It is increasingly **difficult to source non-GM** animal **feed**. That may come as a shock. But could we afford a **two-tier system**? Some distributors already 'double up' for a product but full-scale segregation and traceability would be **difficult and expensive**. A double food-chain will further **weaken food security**. The choice in the end may be: 'not un-GM' or 'mostly organic'.

Meanwhile, what about the new EU **hazard-based approach** for pesticides? Should we develop our own **sustainability matrix** for *all* novel agriculture practices, not just GM?

Farmers, weakly?

We produce food for people by competing with **pests** and **diseases** in **varying soil and weather**. Scientists tell us that GM could now give us a fresh advantage in this struggle, if it were only permitted to – reducing otherwise heavy **chemical and energy input** at a time when **input is *expensive*** and the EU wants **fewer emissions** while tightening up on use of **chemicals**. Unless our farming systems are **economically as well as ecologically sustainable**, those chemicals will still enter the UK on cheap, high-energy **imports** while local farming declines. From here, GM looks like a public good and a half.

Even so, as a farmer willing to give GM a (partial) go, I lack **clear practical rules** for **segregation** and **accountability**. Suppose I plant one GM crop in rotation with several non-GM; or neighbouring GM and non-GM fields? And **how will my public react** to my growing GM – after all that effort over the past decade for us to **reconnect** ...?

Farmers know about what they do. But their **rights and powers** have to negotiate the gamut

of **cultural, gender, labour, market and production issues**. In the UK alone, new cultivars and methods enter such a **heterogeneous** mixture of farming systems that it's hard to know how to evaluate field-trials (those that survive the public's interest).

Seed companies' assumptions have centred on **industrialized agriculture** and **intensive management** systems. To integrate locally with different ethical, cultural, agronomic and time constraints means **serving the farmer whoever he or she may be**. In any case, whether in the UK, Romania or Kenya, what a farmer *should* do with a GM crop (or its saved seed, for example) is not always **what he or she *will* do** under pressure.

Sticky issues

It seems odd that a potato which is modified using GM technology with a gene from another potato should be '**transgenic**' when triticale is not. How shall we compile and agree **a clear GM lexicon**?

And **how shall we label** those foodstuffs grown in soil previously occupied by, or neighbouring, a GM crop? Is GM-fed meat 'produced using GM ingredients'? Because each separate gene requires its own test, there is no simple way to check for any and all **adventitious GM** contamination, so labelling would have to address the **supply chain**, as with organic or free-range products.

Anyway: **what *do* we want to know on labels**? Safety first (allergens, etc); nutrients next (fat, salt, etc); but what then? Fixed European label-legislation may not satisfy UK consumers, who could change their minds concerning what they really care about.

A green thought in a green shade

First-generation GM crops mostly require correct use of proprietary herbicides or other input, so are **not organic-friendly**. **Conservative organic standards exclude GM crops** on several grounds: current types tend to threaten biodiversity; the long-term consequences of their use are unknown; existing methods for altering genes are still unpredictable.

But in other ways, **organic** food-production seems a **natural beneficiary of GM** – because of the possibilities for **reducing chemical intervention** and even **increasing biodiversity** if crop and input management are geared to that end. UK farmers wishing to foster many species in diverse farming environments need to know that **the same GM crop can suppress or encourage biodiversity** depending on how it is managed. They need **well translated research** findings for specific crops, regimes, species and environments, and the **options for combination**.

Part of GM's bad conservation image derives from its first appearance as a **technology characterised by maximisation of profit** rather than public benefit.

Genes and trainers

What about public funding of research findings for farmers, then? Ideally, we'd enjoy **blue-sky**

research communicated in **policy-relevant (and farmer-friendly) scientific translations** – not 'show where you are with the patents for profit'. But how?

Research Councils follow market signals to direct the strategic relevance of research on traits for 'the right sort of crops'. However, public and scientists share concerns that the pressure for an economically viable outcome can lead to **technological 'fixes' rather than good science**. The commercially off-putting 'consumer marketing problem' of GM has also pushed research around in the UK and Europe. The retailers need a big rationale with commercial benefit to work together. We all need **field trials** and **translational research**. But who can do it? The Levy Boards?

GM is not the only option for realising wish-lists of key traits for future needs. What then will be **best value** for money? How would public investment in open-source GM compare with results from **Marker Assisted Selection** (MAS), **Integrated Pest Management, or classic breeding**? (And why on earth not increase food availability in areas of higher potential return: **waste**, for example?)

Principles of cost-effectiveness and social good ought to inspire **shared R&D expenditure** between commercial and private funding, government and research institutions. Perhaps scientists with directors from the Councils and Levy Boards would jointly communicate to Treasury the **importance of good science to good policy**? Biotech and food science link into three government objectives: **environmental change**, stimulating the **green economy** and **human health**. With **public support for biotech research** (rather than commercial), we'll have the right science ready when it *is* needed and wanted – but only if more **public sector spending is put into it**.

To take the GM debate further, we must rearrange ourselves in **new partnerships** – for plant-breeding, commercialising crops, integration of indigenous with academic knowledge, public-private finance, bridging the gap between academic and applied research, etc – while **helping the farmer stay in the middle**. New partnerships might **re-examine food and science funding** *in general*, not only with an eye to GM, so as to hit the ground running with public benefits when the economic downturn reverses.

Who will broker new positions for **coexistence and choices**?

Funding a rule to fulfil

Only very large companies can afford to embark upon the **long and expensive** GM regulatory cruise, and even they think twice.

The fact that the **process is regulated, not the end-product**, can be frustrating. Should a potato lack but one other potato gene for pest-resistance, or a tomato gene require mere de-activation to delay the onset of squishiness, still, the regulatory procedures (and costs) are the same as if tailoring fluorescent mice or sheep that produce human breast-milk.

Even given cheap, snappy regulation, **GM couldn't necessarily deliver** a viable product much faster than other methods and it only addresses single traits. MAS has been more successful in developing **drought-resistance**, which (like many other desirable crop

characteristics) **involves many genes**.

If we want to **take the easier route** towards solving problems, then '**genomics**' (MAS, other non-GM biotech) carries less stigma than 'transgenics'. Let's **choose the right problems** to begin with and emphasise the less regulated, **more acceptable biotech**. Doing so may even help towards simpler regulation for GMOs as end-products.

Umpire-building

The unconvinced public will remain unconvinced unless **someone respected and impartial** introduces and explains GM processes and results simply and clearly (without sounding patronising) and points out specific and definite benefits related to specific needs or problems.

It would be unrealistic to prescribe organisational roles. It would be helpful for organisational representatives to consider **cultural context and nuance** carefully!

The **FSA** is the organisation favoured by the public, followed at some distance by **scientists**: the Royal Society? – the Institute of Biology?

The **challenge is to frame any debate** for open, sincere consideration all round and (for some) to grant validity to differing points of view. **Worst** would be a perception that any **debate is mere window-dressing** for a foregone conclusion.

Meanwhile, apprehensions loom about **public reactions to GM animal feed**.

Letting the genome out of the bottle

It doesn't seem true to say that **if the GM debate were reopened** it would fail the same way, for the same reasons, that it did in the 1990s. There does appear to be a **willingness to discuss GM** in the UK – or, at least, just as much **middle-ground doubt** as ever.

But, looking at the problems that need solving, **a 'GM debate' is inappropriate**. What's needed and wanted is a **general discussion of food security** that offers to include GM as one technique within a biotech folder that forms part of a larger portfolio of solutions.

It's **helpful to recognise 'GM' as a touchstone-term** which animates several different, important, emotive topics – each of which is viewed from many different angles. **Transparency** and undeniable **sincerity** of purpose will be vital, not just on the subject of **new technologies** but also about **social education**, **political structures**, **different values-systems**, **financial constraints** and **uncertainties**. Let's **avoid raising expectations** which won't be fulfilled in the short-term.

The FSA is a good example of an organisation well-placed in the public estimation to catalyse **new consideration of GM** in the wider context of **food security** and how we may **implement new and developing technologies sustainably within a range of farming practices**.

ANNEXE 1

Papers Delivered

"Why reopen the GM debate?"

The Reverend Professor David Atkinson,
Former Vice-Principal, Scottish Agriculture College, Edinburgh and now Curate of St Andrew's Episcopal Cathedral in Aberdeen

"GM in relation to the strategy for the Future of UK Farming"

Sir Donald Curry, KB, CBE
Chairman of the Policy Commission on the Future of Farming and Food

"A Scientist's view of the opportunities and threats, in the UK and wider world"

Professor Robert Watson
Chief Scientific Adviser, DEFRA and Chair, IAASTD

"A Manufacturer's view of why the UK (Public and Farmers) should or should not buy into this new technology"

Mr Davor Pisk
Chief Operating Officer Seeds, Syngenta AG
and
Mr Iain Ferguson, CBE
Chief Executive, Tate and Lyle plc

"A Farmer's view of the opportunities and threats, in the UK and wider world"

Mr Richard Butler
Farmer & former President of The Association of Independent Crop Consultants (AICC)
and
Mr Peter Richie
Whitmuir Farm, Peeblesshire

"Can an ethical case be made for GM food? For whom, where, and on what grounds"
Dr Donald Bruce
Consultant on Ethics in Science and Technology, Edinethics Ltd

"An environmental view of the opportunities and threats, in the UK and wider world"
Professor Rosie Hails, MBE
NERC, Centre for Ecology and Hydrology, Oxford and Oxford Brookes University

"Retailer perspectives on GM: is there a way forward?"
Dr Chris Brown,
Head of Ethical and Sustainable Sourcing, ASDA Stores

"A UK consumer view"
Mrs Joanne Denney-Finch, OBE
Chief Executive, IGD

ANNEXE 2

Participants

Professor Melvyn ASKEW	Founder of Census-Bio; Visiting Professor Harper Adams University College; Fellow of Central Science Laboratory
The Revd Professor David ATKINSON	Former Vice Principal of Research, Scottish College of Agriculture, Edinburgh and Curate of St Andrew's Episcopal Cathedral in Aberdeen
Dr Ray BARCLAY	Director, Global Studies, International Agricultural Programs, University of Arkansas, USA
Mr Ian BELL	Director, ARC-Addington Fund
Mr Tim BENNETT	Chairman, DairyCo
Professor Sam BERRY	Ex-Professor of Genetics
Mr Chris BOURCHIER	Director of Rural Estates, The Crown Estate
Dr Chris BROWN	Head of Ethical and Sustainable Sourcing, ASDA Stores
Dr Donald BRUCE	Managing Director of Edinethics, Consultant on ethics in science and technology
Mrs Ann BRUCE	Senior Research Fellow, University of Edinburgh
Mr Richard BUTLER	Farmer & former President of The Association of Independent Crop Consultants (AICC)
Mr Richard CARDEN, CB	Former Advisor at the European Commission and former Deputy Secretary at MAFF
Sir Donald CURRY KB CBE FRAgS	Chair, Policy Commission for the Future of Farming and Food, and Farmer, Northumberland
Mrs Joanne DENNEY-FINCH, OBE	Chief Executive, IGD
Mr Iain FERGUSON, CBE	Chief Executive, Tate & Lyle PLC
Dr Helen FERRIER	Chief Science and Regulatory Affairs Adviser, NFU
Mr Adrian GANE	Director General, Country Land & Business Association
Mr David GARDNER	Head of Fruit Operations, The Co-operative Farms
Mr Luke GIBBS	Head of Public Affairs for UK and Ireland, Syngenta
Mr David GREGORY	Food Technical Director, Marks & Spencer
Mr Mark GRIFFITHS	Rural Land Management Consultant
Professor Rosie HAILS, MBE	NERC, Centre of Ecology and Hydrology, Oxford and Oxford Brookes Universities
Professor Michael HALL	Institute of Biological, Environmental and Rural Sciences, University of Aberystwyth
Mr Martin HAYMAN	Trustee, Care International UK
Ms Emma HOCKRIDGE	Policy Campaigner, The Soil Association

Dame Deirdre HUTTON, CBE	Chair of the Foods Standard Agency
Dr Huw JONES	Principal Investigator, Plant Molecular Group Leader, Rothamsted Research UK
Professor David LEAVER	Chairman of the Frank Parkinson Agricultural Trust
Dr Julian LITTLE	Chair, Agricultural Biotechnology Council
Mr Rob MACKLIN	Head of Agriculture, National Trust
Mr Jim McLAREN	President, NFU Scotland
Mr Gareth MORGAN	Head of Agriculture Policy, RSPB
Professor Vivien MOSES	Visiting Professor of Biotechnology at King's College, Cambridge and Chairman of CropGen
Ms Helen MUNDAY	Director Food Safety and Science, Food and Drink Federation
Mr Jon NEAL	Communications Manager, IGD
Dr Giles OLDROYD	Plant Scientist, Department of Disease and Stress Biology, John Innes Centre
Mr Tom OLIVER	Head of Rural Policy, Campaign to Protect Rural England
Mr Hugh OLIVER-BELLASIS	Chairman, Royal Agricultural Society of England
Mr Tony PEXTON, OBE, FRAgS, NSch	Farmer and Chairman of NIAB
Mr Davor PISK	Chief Operating Officer Seeds, Sygenta, Basel
Dr Sue POPPLE	Deputy Director, Farming and Food Science and GM Team, DEFRA
Ms Becky PRICE	Researcher, GeneWatch UK
Mr Peter RITCHIE	Whitmuir Farm, Peebleshire
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