

GM Crops and Foods: Follow-up to the *Food Matters* Report by Defra and the FSA

August 2009



GM CROPS AND FOODS: FOLLOW-UP TO THE *FOOD MATTERS* REPORT BY DEFRA AND THE FSA

Summary

1. The *Food Matters* report¹ included two parallel action points for Defra and the Food Standards Agency (FSA) on genetically modified (GM) crops and foods. Both related to the concern that the EU approval regime for GM products could disrupt food and, in particular, animal feed imports, and that there could be associated problems with enforcement of, and public confidence in, GM regulations. This paper reports on the work that Defra and the FSA have undertaken in response to the *Food Matters* points.

Consideration

2. The GM-related recommendations in the *Food Matters* report were as follows:

- *Defra, working with the FSA, will publish an analysis of the potential impacts on the livestock sector arising from global trends in GM production and the current operation of the GM approval system in the EU*
- *In parallel, the FSA, working with Defra, will publish an analysis of the extent to which changes in the market are putting a strain on the regulatory system for GM products (including animal feed) and the implications for UK consumers*

3. These reflect the concern that the rate of EU approvals for GM products, coupled with the absence of any tolerance for low levels of unauthorised GM material, could prejudice UK food and feed imports, because major commodity exporting countries that are already significant GM producers (USA, Brazil, Argentina) might authorise and cultivate new types of GM crop before they are cleared for EU import (a situation known as 'asynchronous approval'). Where a non-EU authorised GM crop is grown, there is potential for an adventitious presence of this crop to arise which may disrupt imports of that commodity from the country concerned, both non-GM (conventional) and EU-approved GM varieties. A specific example of an asynchronous approval problem that has affected UK animal feed supplies was the curtailment around 2006/7 of maize by-product imports from the USA, following its adoption of a new type of GM maize crop without EU authorisation.

Main findings from the Defra and FSA analyses

4. Annexes A and B to this paper cover in more detail the work carried out by Defra and the FSA respectively in response to the *Food Matters* action points. The following paragraphs summarise the main overall findings.

5. UK livestock farmers are currently dependent on soya feed imports from Brazil and Argentina. These two countries supply about 90% of UK soya imports, which in 2007/08 totalled 3 million tonnes. If this supply chain were disrupted due to

¹ *Food Matters – Towards a Strategy for the 21st century* was published by the Cabinet Office Strategy Unit in July 2008 (at http://www.cabinetoffice.gov.uk/strategy/work_areas/food_policy.aspx).

asynchronous authorisations it could have serious adverse effects on the livestock sector (and potentially on consumer prices). The precise impact would depend on the extent and duration of the shortfall in soya imports. There would be limited scope to obtain alternative supplies of soya from other countries, and using other protein feeds instead of soya would involve higher costs and reduce productive efficiency.

6. However, there are arguments as to whether Brazil and Argentina would actually adopt new GM soya varieties before these have secured authorisation in the EU, and there is little certainty about the position going forward.

7. With the continued increase in GM soya cultivation in the main exporting countries (Argentina's production is already about 94% GM while Brazil's is at least 65% and rising), the UK feed and food sectors are worried that it will become impossible to maintain the current non-GM soya supply chain. The situation is of more immediate concern for parts of the animal feed industry due to the volume of soya imported for feed use. Certified non-GM soya costs more than GM, with the premium varying according to the supply and demand situation (it has been anywhere from US\$5/tonne to US\$80/tonne in recent years). The poultry sector is based on the use of non-GM feed ingredients, including soya, as is the organic livestock sector generally. The availability of non-GM soya is also likely to be an issue for the food industry within the next 1-2 years.

8. There is no legislative requirement to label products (milk, meat and eggs) from animals fed with GM feed. Imports of such products from third countries where GM feed has been used (which may not be authorised in the EU) are likely to distort competition for EU producers. Consumers cannot distinguish between the products and may be misled.

Current EU position and the way ahead

9. Towards the end of 2008 the EU approved the import of two new GM feed commodities (one soya and one maize), lessening the immediate concern that there might be an imminent problem with feed import supplies. The Commission has also said that it will bring forward a 'technical solution' which might allow for a more pragmatic interpretation of the EU's zero threshold for non-approved GM material. It nevertheless remains conceivable that a scenario might arise where soya imports to the UK are severely disrupted. According to industry sources there are a number of new GM soya varieties that are due to be commercialised over the next few years, starting in the USA, creating the potential for difficulties to occur because of asynchronous GM approvals². In concluding this work Defra and the FSA will:

- send their analyses to the European Commission, and discuss the implications further with UK stakeholders.

² This prospect has been confirmed in a recent report by the Commission's Joint Research Centre (JRC): *The global pipeline of new GM crops – Implications of asynchronous approval for international trade* (http://ftp.jrc.es/EURdoc/report_GMOpipeline_online_preprint.pdf). It is forecast that, globally, there will be 17 different types of GM soya crop in commercial production by 2015, compared to one in 2008. The JRC report also provides an overview of the issues and concerns on the asynchronous approval/zero tolerance topic.

- continue to argue for a more streamlined EU decision-making process for GM products (without compromising on safety).
- argue for a proper consideration of the EU's policy in relation to the potential presence of low levels of non-EU approved GMOs in bulk-traded commodities, taking account of what is proportionate in safety terms and what might be pragmatic from a trade perspective.
- monitor the timetable for the potential adoption of new GM feed crops in the main supplier countries, relative to the timing of their possible approval for EU import, to gauge the risk that a supply problem might arise if no remedial action is taken.

10. In spring 2009 the Commission initiated an independent evaluation of the EU legislative framework on GM food and feed. The main focus of the evaluation will be the risk assessment and regulatory approval process, the adventitious presence of and zero tolerance for unauthorised GM food and feed, and the labelling rules for approved GM food and feed products. In addition, in June 2009 the Commission indicated that it would be funding a study to look in detail at the implications of asynchronous GM approvals for EU imports of maize and soya animal feed. The work is expected to be completed in the second half of 2010.

ANNEX A

DEFRA WORK ON ANIMAL FEED SUPPLIES AND THE REGULATION OF GM PRODUCTS

Introduction

1. The 'Food Matters' report published by the Cabinet Office Strategy Unit in 2008 included the following action point for Defra in relation to the supply of animal feed and how this might be affected by the regulation of GM products:

Defra, working with the FSA, will publish an analysis of the potential impacts on the livestock sector arising from global trends in GM production and the current operation of the GM approval system in the EU

2. This paper reports on Defra's response to this action point. The FSA has dealt with a parallel action point relating to the extent to which changes in the market are putting a strain on the regulatory system for GM products (including animal feed), and the implications for UK consumers.

Background

3. The UK livestock sector uses imported soya and maize by-products as animal feed, soya in particular, and the main supplier countries for these commodities are now largely GM producers. There is concern that these countries could authorise the cultivation of new varieties of GM feed crop before they are cleared for import into the EU, because the EU decision-making regime for GM products is relatively slow in comparison (and hence this issue is often referred to as one of 'asynchronous GM approvals'). Combined with the EU's zero tolerance for unauthorised GM products, this threatens to create a situation where traders are reluctant to import any commodity into the EU (GM or non-GM) that might have a trace level of unapproved GM material.

4. An immediate focus for concern in this area has been the expected introduction of a new type of GM soya ('Roundup Ready 2'), which was grown for seed multiplication in the USA in 2008. The seed is being marketed to US farmers on a limited basis this year, with a view to full commercial adoption in 2010.

Key overall points

5. Defra has undertaken work and commissioned input from economists on various aspects of the feed import issue. The key points to emerge are as follows.

(a) The existing UK position on the supply / use of imported soya and maize feed

6. At present the UK livestock sector is effectively dependent on imported soya feed, nearly all of which (90%+) comes from Brazil and Argentina. These countries mainly produce GM soya (Argentina's production is around 94% GM and Brazil's 65%, on an upward trend), and this is being used in large volumes as a compound

feed ingredient in the UK and EU (in 2007/08 the UK imported approximately 2.2m tonnes of soybean meal and 0.8m tonnes of soybeans).

7. Of the total amount of soybean meal used for feed in the UK, most is used by the poultry sector (42%), followed by the pig sector (28%) and the cattle sector (19%).

8. The UK used to import significant quantities of maize by-products from the USA for use as animal protein feed (maize gluten feed and dried distillers grains). However, this trade diminished sharply from 2006/7 because the US adopted new GM maize crops before they were cleared for EU import (e.g. the use of maize gluten in UK feed manufacture declined from 609,000 tonnes in 2002 to 43,000 tonnes in 2007). This was the first example of an 'asynchronous GM approval' problem for the UK feed and livestock industries. The reduced import of US maize by-products has been replaced by the use of other feed materials, at a cost to feed compounders and livestock farmers, especially in the ruminant sector.

9. Organic livestock farmers are legally required to use non-GM feed, while for the conventional poultry sector there is currently a market specification that only non-GM feed should be used. Brazil has been the main source of non-GM soya, for which a variable price premium has applied over recent years (from US\$5/tonne to US\$80/tonne). There is concern within the UK feed and food sectors that it is becoming increasingly difficult and costly to maintain a non-GM supply chain, and that it may become unsustainable at some point in the future.

(b) What is the likely impact should feed imports be disrupted, focusing on soya as the key commodity (note: three potential scenarios have been considered - low, medium and high impact - similar to the approach taken by the Agriculture Directorate of the European Commission in a study it undertook in 2008 on the economic impact of unapproved GMOs on EU feed imports and livestock production³)

10. The impact on the UK livestock sector of a loss of soya imports from Brazil and Argentina would depend on the extent of the supply shortfall. Modelling of a hypothetical 'medium impact' scenario, where a complete loss of supply from Argentina is partially compensated by increased imports from Brazil, indicates a relatively limited or manageable impact. However, this would still involve an increase in overall feed costs (possible range 4-23%), the possibility of some reduction in domestic pig and poultry production (1-7%), worsening of trade balances and possible small increase in meat prices (1-4%). Under a 'worst case' scenario, where there are no soya imports from either Argentina and Brazil, the impact would be very significant. There would be a major increase in feed costs (300%+), a significant reduction in pig (24-29%) and poultry (10-68%) production, a reduction in UK meat exports, increase in meat imports, and a marked increase in meat prices (e.g. possible range 9-20% for poultry meat, and much higher for pig meat). The magnitude of the changes under the 'worst case' scenario pushed the limits of the analytical models used, so that while they give a good idea of the general direction

³ http://ec.europa.eu/agriculture/envir/gmo/economic_impactGMOs_en.pdf

and scale of any change, the specific percentage figures should be treated with caution.

11. A significant reduction in UK livestock production could also have a range of consequential effects on land use and the environment. It is however difficult to predict these with any certainty or precision.

(c) The scope for the UK livestock sector to reduce its dependence on imported feed

12. Soya is the most favoured vegetable protein feed because of its nutritional efficiency and competitive cost. If soya product imports were halted or reduced soya feed would have to be replaced by the use of other, less effective and more costly feed materials. This in turn would impact negatively on the productive capacity and profitability of the livestock sector. The pig and poultry sectors would be affected in particular.

13. There would be limited scope to replace the use of imported soya by increasing domestic production of other protein feeds.

(d) The potential for new sources of imported feed to develop from countries that are not GM producers

14. If soya imports were halted from Brazil and Argentina, there might be scope to secure alternative supplies of soya from non-GM producer countries like India, but this would not be expected to cover a significant shortfall in the current supply (total EU imports of soya commodities in 2007 were 42.4m tonnes, whereas total production in non-GM producing third countries was 32.9m tonnes).

15. There is potential for a shortfall in soya imports to be replaced in part by imports of alternative protein crops like oilseed rape from countries such as Russia and the Ukraine, although this would be of a lower nutritional value.

(e) The scope to secure identity-preserved supplies from GM-producing countries that do not carry an unacceptable risk that non-EU authorised GMOs might be detected

16. If a non-EU approved GM feed crop is being grown in a supplier country at the same time as non-GM and/or EU-approved GM varieties, the use of strict segregation and Identity-Preservation systems can reduce the risk of feed supplies being affected by findings of the non-approved material, but they cannot eliminate the risk completely.

How real is the threat of a major feed supply problem?

17. If the operation of the EU authorisation process for GM products remains problematic, a key question is whether Argentina and, in particular, Brazil, will adopt new types of GM soya crop before they are approved for EU import, triggering a feed supply problem. There are different perspectives on this question, and no clear answer.

18. On the one hand, the EU remains a major and therefore valuable market for soya products from South America. Brazil and Argentina would not therefore lightly prejudice their ability to access the EU market, and some stakeholders and industry operators feel sure that these countries will not in fact adopt new GM soya lines unless and until EU import clearance is in place. It might be noted in this respect that whilst concern has focused on the expected adoption of the new 'Roundup Ready 2' GM soya, at the time of writing Defra understands that an application has yet to be made for this GM line to be approved in either Brazil or Argentina. This suggests that there might normally be a gap of one or two years between the commercialisation of a new GM soya crop in the USA and in South America. If so, and noting that the EU has managed to authorise imports of 'Roundup Ready 2' soya before its full-scale commercial adoption in the USA, this tends to suggest that either an 'asynchronous GM approval' problem is unlikely to arise in relation to the main UK/EU soya supply chain, or that from their perspective Brazil and Argentina might at worst have to forego the adoption of a new GM crop for perhaps no more than one season to await EU import clearance (in which context it might be considered particularly unlikely that they would undermine their position in the EU market by taking up non-EU approved GM crops).

19. Economic theory also suggests that changes in price differentials would militate against the use of non-EU approved GM soya lines by Brazil and Argentina. Adoption of non-EU approved varieties would be expected to create two distinct markets, for EU-approved and non-EU approved material respectively, with a price differential in favour of the EU-approved lines. This emerging price differential would reduce the incentive to cultivate non-EU approved crops, and act as a brake on their take-up. The decision whether or not to grow a non-EU approved crop would therefore depend on how the price differential compares to the cultivation benefits. If the benefit were, say, an increased yield of up to 11%, only partially off-set by higher production costs (as claimed for the latest 'Roundup-Ready 2' GM soya line), farmers would be better off not planting the non-EU approved crop if the price differential exceeds about 10%. This price differential would develop as more and more non-approved GM soya is planted. As the price gap for soya products between the EU and the rest of the world widens (and well before it reaches the levels suggested by the 'worst case' scenario analysed by Defra, and probably before it reaches the 'medium impact' scenario) there would be a strong incentive not to switch to non-EU approved crops, and to invest in Identity Preservation systems to enable EU export sales to continue and to benefit from the much higher prices for EU-approved varieties.

20. In contrast to the above, most industry opinion sees it as inevitable or highly likely that Brazil and Argentina will in future adopt new types of GM soya before EU clearance is in place. They point to the fact that with developing countries like China having a big and increasing demand for soya imports, the EU is no longer such a crucial market for suppliers, and therefore the EU market demand may no longer dictate what Brazil and Argentina choose to produce. Brazil has stated publicly its ambitious plans to boost soya production and dominate the global market, and it is possible to conceive a scenario in which it could make economic sense for Brazil and Argentina to grow new GM soya lines even though it would mean foregoing the EU market, because alternative markets are available and the GM crops would

increase their productive efficiency and/or have other beneficial attributes. Another point is that in the past Brazilian farmers have grown GM soya illegally before it was approved by the national authority, using seeds obtained from Argentina.

21. Even if it is unlikely that there will be an asynchronous GM approval problem directly in relation to soya supplies from Brazil and Argentina, there is still a risk that as soon as a new GM soya variety is used in the USA it might lead to trace levels being detected in supplies from other countries, because of the possibility that a bulk cargo vessel is used to ship material from both North and South America. Testing methods are sensitive enough to detect very low levels of GM presence if they are present in a sample, and in practice it is not possible to guarantee that a ship's hold will be completely free of material that was transported prior to the current cargo.

22. The risk that feed supplies could be affected by a low-level presence of non-EU approved GM material could be resolved if the EU allowed a tolerance for this, rather than operating a strict zero tolerance as now. The Commission has undertaken to come forward with a non-legislative 'technical solution' to address the difficulties created by a strict zero tolerance policy. To what extent this would be helpful will depend on the nature of the proposed solution

Publication

23. The following specific outputs from the Defra project will be published on its website:

- *What is the potential to replace imported soya, maize and maize by-products with other feeds in livestock diets?* (paper by ADAS Ltd)
- *Assessing the impact of GM animal feed restrictions in the UK/EU livestock sectors* (paper by George Philippidis)
- *GM Analysis Project – Supply Chain Segregation – Literature Review* (paper by Promar International)
- *GM Analysis Project – Segregation of Supply Chain* (paper by Promar International)
- *Summary of modelling work for Defra feed import project* (paper by Defra)
- *Summary of work on farm-level impacts for Defra feed import project* (paper by Defra)

ANNEX B

FOOD STANDARDS AGENCY WORK ON CHANGES IN THE MARKET AND THE GM REGULATORY SYSTEM

1. The 'Food Matters' report published by the Cabinet Office Strategy Unit contained two action points relating to genetic modification (GM). This report is a response from the Food Standards Agency (FSA) in respect of one of those action points, namely, '*The FSA, working with Defra, has been asked to publish an analysis of the extent to which changes in the market are putting a strain on the regulatory system for GM products (including animal feed) and the implications for UK consumers*'.

2. To deliver this action point the FSA held a series of seven meetings with stakeholders during October 2008. In addition to the original schedule of meetings a separate meeting was held with the animal feed industry in Northern Ireland. Appendix 1 lists the stakeholders who attended the meetings. Discussions with stakeholders were structured as outlined in Appendix 2, focussing on the changes likely to occur in the food and feed market, the individual components which comprise the current regulatory system, and where the potential impact on consumers lies. Appendix 3 provides details of the EC legislative framework for GM food and feed. Appendix 4 provides details of GM crops which are commercially grown in Argentina and Brazil and those which are in the pipeline. The status of the crops in the EU is also included.

3. The points outlined below summarise the relevant comments made during the meetings. A range of comments were made at the meetings often with differences of opinion being expressed. The report has been seen in draft form by stakeholders at a meeting held on 24 November and further comments have been incorporated to reflect views expressed.

Changes in the market

GM Food

4. Stakeholders reported that there has been no change in the policies of UK retailers and food manufacturers in recent years regarding GM-derived food ingredients. Namely, there is no market for GM-derived food ingredients within the UK, and a continuing demand for identity preserved (IP) non-GM soya and maize, ingredients derived from which are used in food products. It was reported that there is some use of GM food ingredients in the UK, particularly in the catering sector where oil from GM crops is often supplied to customers who are working to lower prices, and bulk packs are suitably labelled. However, it was considered unlikely that relevant information regarding food produced using such oils is provided to the final consumer, as required in EC legislation.

5. There is no legislative requirement in the EU to label products from animals fed GM feed. Some retailers stipulate that non-GM feed should be used for certain livestock. It was noted by some stakeholders that products from animals (e.g. meat)

imported from third countries where non-EU authorised GM varieties were used would undercut EU producers, distorting competition.

6. Food manufacturers noted that the cost of sourcing non-GM food ingredients is increasing with the prices for non-GM sources being estimated as 10-20% higher than those for GM. Retailers were concerned that they may not be able to maintain their current non-GM sources of supply as producers increasingly adopt GM technology around the world.

GM Feed

7. The UK is reliant on imported protein for animal feed, significant amounts of which is derived from GM crops. It is not possible to provide specific data on the volumes of imported feed materials that may be GM or GM-derived. Custom codes are not sufficiently informative to allow detailed information of this nature to be collected. The adoption of GM technology by commodity-exporting countries, particularly in North and South America means that imported feed materials will contain an increasing proportion of GM-derived products. Further information about the use of GMOs in feed is available on the FSA web site (www.food.gov.uk/gmfoods/gm/gmanimal).

8. Some stakeholders reported that the demand for non-GM feed has been decreasing with parts of the UK livestock industry moving away from organic or identity preserved conventional feed. Where non-GM feed is being sourced some suppliers are unable to guarantee availability after April 2009. The premium for non-GM feed was quoted by The Grain and Animal Feed Trade Association (GAFTA) as being £50-60 per tonne above GM feed in February 2008. However, market prices vary with the premium for non-GM soya in November 2008 being £30 per tonne. A report from Cardy-Brown Co Ltd notes that in 2004 the premium was only \$5 per tonne. This rose to \$10 in 2005/6 and in 2007, when there was a shortfall in non-GM soya, the premium rose to \$60-80 per tonne.

9. In February 2008 it was estimated that 85-90% of compound feed fed to livestock in the EU will contain one or more GM events (i.e. varieties or lines) (European Feed Manufacturers' Federation (FEFAC) February 2008). This figure was disputed by some stakeholders. The presence of GM reflects the fact that while segregation is not difficult for non-GM and GM feed, there is a lack of demand for this practice from other non-EU markets leading to the presence of GM events.

10. Some stakeholders noted that other sources of protein should be explored for use in animal feed in order to reduce the UK feed industry's dependence on imported soya. However, the feed industry's research has shown that UK protein production could only replace 10-20% of the protein supplied by imported soya. What is clear is that soya remains the most important source of protein in animal feed at present.

Supply of commodity crops

11. The supply chain of commodity crops (e.g. soya and maize) is complex. Countries exporting these crops are growing both EU-authorised and non-EU-

authorised GM crops, as well as non-GM crops. A difference of view was expressed regarding the supply of non-GM commodity crops. Some stakeholders noted that the supply is decreasing possibly as a consequence of an increase in the volume of GM crops being grown and the potential for non-EU authorised GM varieties to enter the non-GM supply chain as adventitious presence. Others considered that there was an increased demand for identity preserved non-GM supplies, acknowledging that demand varied depending on the crop. Producers are readily able to find a market for non-GM goods outside the EU.

12. Some stakeholders considered that the supply of non-GM soya to the EU market could be reduced as exporters switch to supplying the rapidly increasing demands in the Chinese and Indian markets. The report published by Cardy Brown Co Ltd in October 2008 stated that China currently imports 47% of world soybean trade compared with 22% imported by the EU. 44% of soybean meal (mainly from Argentina and Brazil) is exported to the EU. However, other stakeholders considered that Argentina and Brazil are committed to not growing GM varieties that were not authorised in the EU in order to protect their export trade to the EU. Brazil's soya production in 2007 comprised 65% GM soya (Source: Ministry of Agriculture, Livestock and Food Supply, Brazil). In Argentina GM crops comprise 94% of total acreage (Source: Agriculture, Livestock, Fisheries and Food, Argentina). One stakeholder estimated that between 40 and 50% of soymeal entering the EU will be non-GM.

13. The current situation with asynchronous authorisations (i.e. timing of GM authorisations in the EU being out of step with major countries of production and export) increases the potential for adventitious presence of non-EU-authorised GMOs. Such consignments would be illegal in the EU. Annex 4 lists GM crops currently grown commercially in Argentina and Brazil and those in the pipeline, comparing these with the regulatory status in the EU. The recent EU authorisation of Liberty Link soya and Roundup Ready 2 soya will reduce the number of GM soya varieties being grown in third countries which are not authorised in the EU, and therefore reduce the potential for unauthorised presence. However, concerns were raised by some stakeholders who reported a stacked event GM soya (containing the Roundup Ready gene and a gene conferring resistance to Bt) which is likely to be grown in South America from 2010 has yet to have an application for authorisation submitted in the EU.

14. Following the detected presence of GM maize variety Bt10 (not authorised in the EU) in imports from the USA in 2005, and more recently the potential for the accidental presence of the unauthorised GM maize Herculex, the feed industry has stopped importing corn gluten feed from the USA. The levels of corn gluten feed previously imported were however quite low. Where cargoes have been rejected due to the presence of unauthorised GM varieties these have been re-directed to other markets. Alternative cereal proteins have been sourced but at an additional costs to livestock producers.

The regulatory system

Risk assessment and authorisations of GMOs

15. All stakeholders supported a robust and rigorous safety assessment, and agreed that if this process was speeded up to address problems associated with asynchronous approvals there should not be a reduction in the standard of assessment.

16. Some stakeholders considered that the European Food Safety Authority (EFSA), in relation to its work on GMOs, was under pressure in terms of resource, and its capacity needed to be increased.

17. There is clearly an onus on the applicants who submit dossiers for assessment to provide good quality data in the first instance to minimise delays in the assessment process. EFSA recognises that one source of delay in evaluating new GM products is the need to go back to the applicant seeking additional information and/or clarification to complement the application dossier. EFSA is therefore updating its guidance document in order to provide clearer and up-to-date direction to applicants, and to take account of the latest scientific and technical developments. If successful, the introduction of the revised guidance will minimise the need for EFSA to suspend evaluations while awaiting additional data from the applicants, thus increasing the efficiency of the assessment process.

18. Some stakeholders considered that where EFSA is asked for an opinion on a specific issue (e.g. the safety of an unauthorised GMO which has inadvertently entered the EU supply chain) its advice can often be open to interpretation, and it is essential that advice should be unequivocal.

19. In addition to the requirement placed on EFSA to assess applications, concerns were raised that EFSA's work on new GMOs can be delayed when it is asked to re-consider its existing advice. The challenge may arise for political reasons or science-based safety concerns. It was also noted that there are delays in the authorisation process after EFSA had issued its opinion. A qualified majority either in favour or against was never obtained at the EC Standing Committee resulting in decisions being deferred to the Council of Ministers and then ultimately back to the European Commission.

20. It was noted that new GM events are being developed at a faster rate than applications are being processed in the EU. The position as of November 2008 was 42 events being considered for authorisation in the EU. Over the past 2 years 15 events have received favourable opinions from EFSA with 8 of these subsequently authorised for use in food and feed. The remaining 7 applications are awaiting authorisation. Additional questions have been raised with EFSA by the Commission regarding 5 of these applications.

Enforcement

21. A number of factors were identified by stakeholders in relation to enforcement activity to ensure compliance with EC legislation on GM food and feed. One of the key areas of concern was the lack of reference materials for unauthorised GMOs; linked to this is a lack of knowledge regarding new GM varieties being developed in third countries. Whilst qualitative methods can be used for general screening for the

presence of GM material, and specific methods exist for authorised GMOs, identifying unauthorised GMOs is not possible, except where there is a validated method.

22. The cost of routine testing for GMOs is prohibitive which can lead to only small numbers of samples being collected. This means that laboratories are unable to justify the cost of maintaining staff expertise and the investment of capital in equipment and laboratory consumables. In turn, this can lead to a lack of provision in public analyst laboratories capable of providing GM analysis and the turnaround time for analysing samples due to other competing work priorities. This can be problematical for enforcement authorities waiting for results and operators waiting for samples to be verified, leading to additional costs.

23. The absence of methods for identifying stacked gene events was noted as a particular difficulty, as methods are currently only available for each single event. Estimating the GM content where a stacked event is present is problematical, and can result in levels being overestimated as above the 0.9% labelling threshold for the adventitious presence of GM ingredients. This is because it is not possible to prove whether the GMO present is there as a single event or a hybrid where a mixture of both may be present. Sophisticated techniques could be used to identify unauthorised GMOs (such as whole genome pyrosequencing) but these are not suitable for use in routine surveillance due to the costs involved and the need for specialist knowledge and equipment. The Codex Task Force in Foods Derived from Biotechnology and the work it completed on the low level presence of unauthorised GMOs was cited as an initiative which should be considered further.

24. It was noted by stakeholders that enforcement activity and routine surveillance for GMOs tends to be undertaken in response to particular incidents. Financial constraints on local authorities mean that work is not usually undertaken routinely as this may detract from other areas of safety concern; as a result samples are taken infrequently. Some stakeholders considered that the guidelines for sampling GMOs published by the European Commission were inconsistent and more onerous than the international standards and these should be brought in line with each other. The use of a central database for collating the results of GM testing was considered to be essential.

‘Zero tolerance’

25. The legislation for GMOs is based on a positive list and implies a *de facto* zero tolerance for unauthorised GMOs in the EU.

26. Stakeholders held different views on whether ‘zero tolerance’ was achievable. While both the food and feed industry aimed for zero GM presence through their identity preserved supply chains, in practice this is not achievable for either authorised and non-authorised GMOs. Often levels of adventitious GM presence are above the 0.9% threshold and are labelled accordingly. Some therefore felt that zero tolerance for EU-unauthorised varieties hindered the ability to supply non-GM food and feed in the EU.

27. The 'technical solution' for unauthorised GMOs under consideration by the European Commission was seen by some as not protecting consumers because it would allow the low level presence of unauthorised GMOs to be in the supply chain. Such an approach was seen as weakening the regulatory structure because it would increase the risk of unauthorised GM varieties entering the supply chain. Some stakeholders felt that a 'technical solution' of this nature could lead to pressure throughout the supply chain to allow any or all GM events, whether these were authorised elsewhere or not.

28. The current situation with US long grain rice was cited as an example, where following the incident with GM LLRICE 601 in 2006, imports of US long grain rice are said to be only one tenth the volume supplied prior to the incident. The potential for small quantities of unauthorised GM rice to be present in consignments rendering the rice illegal for import resulting in traders to take commercial risks. Others considered that the incident demonstrated regulatory failure in the US and that there should not be a relaxation of the EU authorisation process to address this.

29. Other stakeholders considered that a 'technical solution' was a necessity in order to maintain the current supply of animal feed into the EU. The consequences of an adventitious low level presence being detected in the supply chain resulting in a shipment being refused entry into the EU could have serious implications for the livestock industry and potentially a reduction in food supplies. Parallels were drawn with tolerances permitted in other legislation, for example regulations on pesticides. It was suggested that a positive opinion from EFSA should be sufficient to allow low level adventitious presence of a non-authorised GMO. However EC Regulation 1829/2003 on GM food and feed does not allow for this.

Implications for consumers

30. Stakeholders noted that consumer concerns regarding GM technology tend to fluctuate with time, and may increase particularly in response to increased media coverage. The FSA's own research, which tracks public attitudes, shows GM technology is not a pressing concern for consumers. The FSA quarterly tracker has shown a steady decline in concern when consumers are prompted, from 43% in 2001 to 27% in September 2008. Spontaneous concern in relation to GM technology peaked in December 2003 at 20% with a steady decline to 6% in September 2008. However, a lack of consumer concern about GM technology should be contextualised with consumer belief that the 'problem' had been 'dealt with' and there was therefore nothing to be concerned about (i.e. retailers do not sell products containing GM food ingredients).

31. There is a legal requirement to label both GM food and feed ingredients. Consumers therefore are able to make an informed choice regarding GM food ingredients (if these are being used).

32. Many consumers are unaware of the extent to which GM feed is used as there is no legal requirement to label products from animals fed on GM feed. Retailers have differing stated policies regarding the use of the terms 'GM', 'non-GM' and 'GM-free', which can lead to confusion for consumers. It should also be borne in mind that regardless of retailers policies regarding animal feed for UK livestock, animal

products imported from outside the UK are likely to have received GM crop varieties that have not been through the EU approval process in their feed. It was reported that costs of maintaining non-GM supply chains are currently absorbed by farmers and feed compounders rather than being passed on to consumers. However, in the longer term these costs may result in increases in the price of products from animals (e.g. milk, meat and eggs), for consumers. In November 2008 it was considered that the premium for non-GM feed for UK agriculture could rise from £24M to £45M per annum (Agriculture Industries Confederation), which would eventually restrict consumer choice as products from third countries would be cheaper. The use of non-GM feed by UK producers could therefore be driven out by market forces.

33. It was noted by a number of stakeholders that it may be timely to inform consumers of the issues surrounding GM and non-GM supply chains so that they have a clear understanding of current science, the status of the non-GM market being reliant on only a few exporting countries, and the steady increase in GM production.

General conclusions

34. While there is consensus across stakeholders on some issues there are divergent views on others.

35. The need for a robust and rigorous safety assessment was agreed by all stakeholders. The supply of soya was the subject of considerable debate with different views being expressed by the animal feed industry importing the soya, and a certification body which has set up certain identity preserved supply chains.

36. The issues identified at the meetings are more immediate for the feed industry. However, there will be parallel issue for the food industry in the future. The UK is not self sufficient in protein for animal feed. GM and non-GM-soya as a source of protein is imported from Argentina and Brazil. Demands from the EU differ to those from third countries with respect to the GM varieties grown, and which are authorised for import into the EU. This could potentially cause problems where low level adventitious presence of non-EU authorised GM varieties in imports of GM and non-GM feed would result in the entire consignment being illegal under the EC regulatory framework. This presence is likely to arise from material which is being grown as part of field trials. This could cause supply problems for the animal feed industry, and ultimately supply of food to consumers. The economic consequences on the supply to the EU livestock industry are being considered by Defra as a separate action point in the 'Food Matters' report.

37. There is no legislative requirement in the EU to label products from animals fed GM feed. Some retailers stipulate that non-GM feed should be used for certain livestock. It was noted by some stakeholders that products from animals (e.g. meat) imported from third countries, where non-EU authorised GM crops were fed to livestock would undercut EU producers, thus distorting competition. Consumers are unable to distinguish between sources of products from animals, and are likely to be unaware that GM feed is widely used. Country of origin labelling would not tell consumers if animals have been fed GM feed. Consumers may feel that they are being misled.

38. Following the conclusion of the stakeholder meetings, the European Commission announced in December 2008 that it will be commissioning an evaluation of the EU legislative framework on GM food and feed recognising that GMOs continue to be a controversial issue. The evaluation, which will begin in April 2009, will identify present and future challenges, and ensuring its relevance for current needs. The main areas of focus of the evaluation will be the risk assessment and regulatory approval process, the zero tolerance and the adventitious presence of unauthorised GM food and feed, and the labelling rules for GM food and feed. The work will take 12 months to complete.

Appendix 1 – Organisations who attended the FSA stakeholder meetings

Consumer groups

Which?

Consumer Focus

SUSTAIN

Caterers

British Hospitality Association

3663

Brakes

Animal feed industry and farming organisations

Agriculture Industries Confederation

Grain and Animal Feed Trade Association

National Farmers Union (NFU)

NFU Cymru

Farmer's Union of Wales

Scottish Agricultural Science Agency

NFU Scotland

QM Scotland

British Poultry Council

British Egg Information Council

British Pig Executive

British Meat Processors Association

AB Agri

Northern Ireland Grain Trade Association

Ulster Farmers Union

O'Kane Poultry

Food retailers

British Retail Consortium

Marks and Spencer

Sainsbury

Aldi

Morrisons

Tesco

Co-op

Somerfield

Food Manufacturers/companies

Food and Drink Federation

Rice Association

National Association of British and Irish Millers

Scottish Food and Drink Federation

Moy Park

2 Sisters Food Group

Enforcement Authorities/Testing and Certification bodies

LACORS

Central Science Laboratory
Worcestershire Trading Standards
Chartered Institute of Environmental Health
Laboratory of the Government Chemist
Reading Scientific Services Limited
Worcestershire Scientific Services
Cert-ID
Genetic-ID

Non-Governmental Organisations

Friends of the Earth
Soil Association
GM Freeze
GM Free Cymru

Government departments

Department of Agriculture and Rural Development Northern Ireland
Defra
National Assembly of Wales

Appendix 2 – Outline of discussions held with stakeholders

Changes in the market

- Fact -proportionately more GM crops (increased volumes) being grown worldwide, particularly soya and maize.
- Fact - new GM varieties being developed and grown (in non-EU countries)
- Is the demand for non-GM food within the EU market unchanged (artificially imposed?)
- Is there increased demand for non-GM feed (can this be quantified?)

Strains on the regulatory system

- Is there sufficient capacity within EFSA to process the number of GM applications?
- What is the strain on enforcement authorities in monitoring presence of GM varieties in food and feed? How can this be alleviated?
- Do food and feed operators have the ability to comply with the strict zero tolerance for unauthorised GMOs that is implied by the legislation on GM food and feed?

Implications for consumers

- What is the cost of maintaining non-GM supply lines? Who really pays?
- Do food operators have the ability to maintain their stated policies on the use of GM food and/or feed?
- What is the availability of imported products which meet EU requirements (choice)?
- How confident are consumers regarding the food on the market and how this is described?

Appendix 3 – Overview of EC legislation on GM food and feed

EC Regulation 1829/2003 lays down rules for the authorisation and labelling of genetically modified (GM).

The European Food Safety Authority (EFSA) is responsible for carrying out the safety assessment of dossiers submitted by applicants seeking authorisation. Guidelines have been published by EFSA on this process and the information which must be provided. The scientific opinion from EFSA is published and the Commission carries out a public consultation before authorisation is finalised.

Applicants seeking authorisation are required to provide a detection method and samples of reference material which can be used for control purposes. The method is validated by the European Community Reference Laboratory prior to authorisation.

Decisions regarding authorisation of GM food and feed are taken at the EC Standing Committee via a qualified majority vote. In line with standard EU procedures, the decision is escalated to the Council of Ministers if a qualified majority is not achieved.

A threshold of 0.9% of material from a GMO (which is authorised in the EU) in a non-GM source is permitted (and doesn't require labelling) providing the presence can be demonstrated that it is adventitious or technically unavoidable. The presence of an unauthorised GMO is not permitted at any level.

Labelling is required to inform the final user that a food or feed consists of, contains or is produced from GMOs. Labelling is required irrespective of the detectability of DNA or protein resulting from the genetic modification in the final product.

Labelling is not required for products (e.g. meat, milk, eggs) from animals fed GM feed.

Appendix 4

Commercially grown crops and pipeline of new crops awaiting authorisation in Argentina (Agriculture, Livestock, Fisheries and Food, Argentina)

Crop/Event	Trait	Commercially grown/In pipeline	Regulatory status in EU
Soybean 40-3-2	HT	Commercial (since 1996)	Authorised
Maize Bt176	IR	Commercial (since 1998)	Authorised
Maize T25	HT	Commercial (since 1998)	Authorised
Maize MON810	IR	Commercial (since 1998)	Authorised
Cotton MON531	IR	Commercial (since 1998)	Authorised
Cotton MON1445	HT	Commercial (since 2001)	Authorised
Maize Bt11	IR	Commercial (since 2001)	Authorised
Maize NK603	HT	Commercial (since 2001)	Authorised
Maize TC1507	IR + HT	Commercial (since 2001)	Authorised
Maize GA21	HT	Commercial (since 2005)	Authorised
Maize NK603xMON810	IR + HT	Commercial (since 2007)	Authorised
Maize NK603xTC1505	IR + 2HT	Commercial (since 2008)	Authorised
Soybean A-2704-12 (Liberty Link)	HT	In pipeline	Authorised
Cotton MON531xMON1445	IR + HT	In pipeline	Authorised
Maize LY038	High free Lys	In pipeline	Not authorised
Maize LY038xMON810	High free Lys + IR	In pipeline	Not authorised
Maize Bt11xGA21	IR + HT	In pipeline	Not authorised
Maize MON89034	IR	In pipeline	Not authorised
Maize MIR162	IR	In pipeline	Not authorised
Maize MON89034 x MON88017	2IR + HT	In pipeline	Not authorised

MON88017	IR + HT	In pipeline	Not authorised
Soybean A5547-127	HT	In pipeline	Not authorised
Rice LL62	HT	In pipeline	Not authorised

Commercial crops and pipeline of new crops in Brazil (Ministry of Agriculture, Livestock and Food Supply, Brazil)

Crop/Event	Trait	Commercial/In pipeline	Regulatory status in EU
Soybean GTS-40-3-2	HT	Commercial	Authorised
Maize T25	HT	Commercial	Authorised
Maize MON810	IR	Commercial	Authorised
Maize Bt11	IR	Commercial	Authorised
Maize NK603	HT	Commercial	Authorised
Maize GA21	HT	Commercial	Authorised
Cotton MON531 Bolgard I	IR	Commercial	Authorised
Cotton LLCotton25		Commercial	Authorised
Cotton 1445	IR	Commercial	Authorised
Soybean A2704-12 Liberty Link	HT	In pipeline	Authorised
Cotton 281- 24-236 / 3006-210-23	IR	In pipeline	Not authorised
Cotton Bolgard II	IR	In pipeline	Not authorised
Maize Herculex	HT/IR	In pipeline	Authorised
Maize MIR162		In pipeline	Not authorised
Rice LLRICE62	HT	In pipeline	Not authorised