

ADVISORY COMMITTEE ON NOVEL FOODS AND PROCESSES**ALLERGENICITY TESTING OF GM FOODS****Issue**

The Committee is invited to comment on points raised in a critique of the current EU approach to allergenicity testing of GM foods, recently circulated by Friends of the Earth.

Background

1. In February 2006, Friends of the Earth (FoE) circulated a briefing paper "Could GM foods cause allergies – a critique of current allergenicity testing in the light of new research on transgenic peas" (**Annex A**). This document identifies allergy testing as one of the main safety issues in relation to GM foods and makes a number of recommendations in relation to the current EU guidelines for allergenicity testing.
2. In the EU, safety assessment of GM foods is conducted by the European Food Safety Authority (EFSA), which published guidelines for these assessments in March 2005. The section of the EFSA guidance document dealing with allergenicity assessment is attached (**Annex B**).
3. The specific recommendations of the FoE paper are itemised below, numbered (a)-(k) for convenience, with comments from the Secretariat.

(a) EFSA's guidance for allergenicity testing must be tightened up to at least the level of the preceding Joint Working Group guidelines and include the full recommendations of the FAO/WHO guidelines

This is a reference to the previous EU guidelines, which were produced by the European Commission's scientific advisory committees and which were used by EFSA's GMO Panel as the starting point for development of the current guidance document. FoE consider that the 2003 guidelines from the Joint Working Group, and the recommendations from a FAO/WHO expert group that met in 2001, provide a better basis for risk assessment than the current EFSA guidance and the equivalent international guidance (Codex Alimentarius guidelines adopted in 2004¹). Unlike the earlier documents, the step-wise approach advocated in the current EU and Codex guidelines does not require the routine use of human serum screening, pepsin digestion tests or testing with animal models unless there is other evidence of potential allergenicity.

¹ Codex Guideline for the Conduct of Food Safety Assessment of Foods Derived from Recombinant-DNA Plants (2003); available from <http://www.codexalimentarius.net/>

(b) There should be much greater scrutiny of the methods used in applications to justify the conclusion of lack of significant allergenic risk, for example pepsin resistance tests must use realistic simulations, and should not be used as a rationale for no further testing

The EFSA guidelines mention the use of pepsin resistance tests either (a) where the source of the introduced gene is allergenic and the introduced protein shows no sequence homology with known allergens, or (b) as a possible additional criterion in the overall risk assessment of introduced proteins that show sequence homology to known allergens. FoE suggest that this test may overestimate the digestibility of proteins *in vivo* and it is therefore of limited value.

(c) The use of surrogate proteins is not acceptable – protein produced by the GM plant that will actually be eaten must be used in allergenicity assessments.

In this context, the FoE paper refers to the results obtained in a recent Australian report on GM peas – see point (h) below – which provides confirmation that proteins derived from different expression systems may be subject to different post-translational modifications resulting in different biological properties.

The EFSA guidance clearly states "It is essential that the tested protein is equivalent to the newly expressed protein as it is expressed in the GM plant". The use of surrogate proteins is acceptable only if there is extensive evidence of equivalence with the protein expressed in the GM plant.

(d) Assumptions of safe historic use/low level of protein expression are not acceptable in allergenicity assessments.

These criteria are not mentioned in the EFSA guidance, although some applications dossiers for GM foods may refer to them.

(e) Proteins must be considered on a case by case basis, not using prior evaluations for different crops

The FoE paper criticises EFSA opinions that refer to previous assessments of the same proteins carried out in the context of other GM crops and suggests that this is inconsistent with the principle of conducting case-by-case risk assessments.

(f) The entire GM plant must be considered in allergenicity assessments, not just the protein it is genetically modified to produce

The current guidelines refer to the possibility of allergens other than the introduced protein, but only where the plant containing the genetic modification is itself known to be allergenic. The FoE paper recommends that further allergenicity testing of all GM plants is needed because of the potential for unintended mutations arising from the transformation process.

(g) Lack of consideration of animal allergenicity must be properly justified.

(This recommendation is not related to assessment of GM food; the ACNFP previously made a similar comment during the public consultation on EFSA's

guidelines, in relation to the statement that allergenicity in farm animals "is not a significant issue". This statement is also found in the final guidelines.)

(h) Currently approved GMOs must be reconsidered in the light of the findings of the transgenic pea research

The ACNFP considered the recent Australian report on an alpha-amylase inhibitor from beans, expressed in GM peas, in November 2005 (paper ACNFP/74/9). The Committee considered that the results were not surprising and emphasised that the standard risk assessment of GM foods, carried out in line with the EFSA guidelines, would identify any differences in post-translational modification and that any such alterations would trigger additional requirements for toxicity and allergenicity assessments.

EFSA's GMO Panel subsequently considered this research at its meeting in December 2005 and the Panel's conclusions have been published as an Annex to the minutes of that meeting (**Annex C**). This statement confirms that there are various indications that would have triggered a requirement for additional investigations into potential allergenicity, if the GM pea used in the Australian studies had been submitted for authorisation in the EU.

4. The three remaining recommendations in the FoE paper are less concerned with risk assessment procedures and are more to do with risk management and the framework for regulation of GM foods:
 - (i) The need for a GMO must justify the issues involved in its testing, including ethical issues around the use of animal models as well as whether this is the best use of resources
 - (j) Where the need can be justified, the full range of available and applicable tests must be used, including targeted human serum screens, prior to animal testing
 - (k) Until there are validated and accepted methods for full detection of potential allergenicity, there should be no further approvals of GM crops and foods, and existing approvals should be suspended.

Committee action required

5. The Food Standards Agency would welcome the Committee's advice and comments on the points raised in the FoE paper, and on the specific recommendations (a) to (h) listed above in paragraph 3, in relation to the allergenicity assessment of foods from GM plants.

Secretariat
March 2006

Annexes attached:

- Annex A:** Friends of the Earth briefing paper "Could GM foods cause allergies? – a critique of current allergenicity testing in the light of new research on transgenic peas" (February 2006)

Annex B: EFSA guidance on allergenicity testing of food and feed derived from GM plants. Available from <http://www.efsa.eu.int>

Annex C: “Genetically modified pea expressing the protein alpha-amylase inhibitor” Annex 2 to the Minutes of the 23rd Plenary meeting of the EFSA GMO Panel, held on 6-7 December 2005. Available from <http://www.efsa.eu.int>

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Friends of the Earth briefing paper "Could GM foods cause allergies? – a critique of current allergenicity testing in the light of new research on transgenic peas" (February 2006)

Available from Friends of the Earth. Contact details can be found at: www.foe.co.uk

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March 2006**

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EFSA guidance on allergenicity testing of food and feed derived from GM plants

Extract from "Guidance document of the Scientific Panel on Genetically Modified Organisms for the risk assessment of genetically modified plants and derived food and feed; (The EFSA Journal 2004, volume 99, pages 1-94).

Available from <http://www.efsa.eu.int>

**Secretariat
March 2006**

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EFSA GMO Panel's comments on immunological effects observed in mice exposed to genetically modified peas containing an alpha-amylase inhibitor

Annex 2 to the Minutes of the 23rd Plenary meeting of the EFSA GMO Panel, held on 6-7 December 2005.

Available from <http://www.efsa.eu.int>

**Secretariat
March 2006**