"It is important to acknowledge that we still may not be asking all of the right questions, let alone have the science to provide answers to them" (GM Science Review p.186)

Response to GM Science Review, First Report, from Munlochy GM Vigil:

We would like to make three general points to start:

1 The whole report is predicated on the reductionist view of the science of genetics, and the role that this theory states that DNA plays. This is not the only scientific view of genetics. The so called "Central Dogma" has been questioned by many. An approachable discussion of the Central Dogma, and alternative views has been written by geneticist Barry Commoner. Titled "Unravelling The DNA Myth" (it can be found at http://www.grain.org/seedling/seed-03-07-2-en.cfm)
The Science Review should pay far more attention to the fundamentals (and surrounding scientific disagreements) on which GM/GE is based. This will also question whether in fact GM crops can be assessed on a case by case basis.

2 The Report is commendably honest by pointing out the lack of science and research available on GM crops and foods. Although it did not proclaim this as its main conclusion, the press and public were able to determine this for themselves.
Unfortunately some of the conclusions drawn by the authors of some sections, do not seem to take this into account, and hence could be seen more as supposition and opinion than science based.

3 We have read the BTO response to the Review and would very much like to echo its concerns on the quality of the science available and presented.

General Overview:

Would it be a worthwhile exercise to change the balance and membership of the panel prior to the completion of the final review process?

Some Further Points:

Chapter 4: How Reliable is GM Plant Breeding:

It is disingenous to try and compare the stability and safety of established crops and foods, which have been proven over many generations, with GM crops which use fundamentally novel techniques, and have existed for only a very short period of time.
There is no necessity for GM crops or foods, so why should we take any risk with our food production, environment and health by growing and consuming them?

Unanticipated side effects have been found in GM crops some of which you actually detail in your report (pgs. 121,187). Others are detailed by Commoner (ref above), and Ohio State University (see Other research to include). More may yet to be/ never be discovered, the actual effects on environment and health are unknown.

Reports from India,(inc. from Agriculture Officials) claim that the first crop of GM Cotton grown there are a "resounding failure"

Chapter 5: GM Derived Food and Animal Feed Safety:

There have been no tests on the safety of GM pollen.

No peer reviewed publications of clinical studies on the human health effects of GM foods exist.

There is a scarcity of safety tests and compositional and nutritional/ toxicological studies carried out on GM crops and foods. Some of these show worrying if controversial results. An overview can be found at (http://www.actionbioscience.org/biotech/pusztai.html)

The report by the Health Committee of the Scottish Parliament on GM crops is mentioned and rebutted but surprisingly none of its findings were actually stated. We think it is only fair if they are put into your report and outline some of them here:

The Committee, having considered the evidence has concerns about the robustness of risk assessment procedures in relation to public health.

The Committee is convinced of the need for additional toxicological tests and, after considering the evidence, would also wish to see pharmaceutical style testing being applied to GM crops.

The Committee believes more research should be commissioned into the effect, allergic or otherwise of genetically modified pollen.

The full Health Committee Report, which was written after taking evidence from "both sides" on the GM issue, is available on the Scottish Parliament Health Committee website.

Transgenic DNA has recently been found in pigs (see Other research) and as the FSA pointed out to you in their review of your draft, will be found in milk and meat from animals fed on GM feed. This has untested safety implications.

Pigs across Iowa experienced an 80% fall in farrowing rate after being fed GM bt maize. Once GM maize was removed from the diet, farrowing rates returned to normal. The unanticipated side effects of GM foods and feedstuff are complex and may be indirect, but empirical evidence does exist. (Iowa Farm Bureau Spokesman, May 2002)

Chapter 6: Environmental Impact of GM Crops:

Recent research Wilkinson et al, and from DEFRA should now be incorporated into this section. See "Other research" for refs.

Other research, which we also detail should also be included.

GM traits transferred to wild species, may in fact reduce the viability of these species directly, by contaminating a small gene-pool with inferior DNA.

DNA has been found to remain in soil for 2000 years. What effect will GM DNA have in that time? (Prof Alan Cooper. Oxford University)

Chapter 7: Gene Flow, Detection and Impact of GM Crops:

The recent publications by DEFRA on research in this area should now be incorporated. (Please see Other research.)
As should other research that we detail.

.See above for DNA in soil!

If Horizontal Gene Transfer is a natural process, and if HGT of genetic material from a GM plant has been "achieved" in laboratory conditions, how long before it does occur/ is detected in "the field"? And what may be the consequences?

Conclusion:

Article 4 of EU Directive 2001/18 states:

"Member States shall, in accordance with the precautionary principle, ensure that all appropriate measures are taken to avoid adverse effects on human health and the environment which might arise from the deliberate release or the placing on the market of GMOs. Whether direct, indirect, immediate or delayed".

Other Research to include in final review of available science:

This list is certainly not exhaustive, and contains very recent research, but it does intimate omissions in the First Report:

Arnaud J F (Lillle University) from New Scientist and Nature, June 2003 Research into gene flow from sugar beet (concludes gene flow can occur at least 1500m away and that seeds are a major cause due to accidental transportation).

A study carried out at the Russian Academy of Sciences Institute of Nutrition which showed that rats fed on beetroot and transgenic potato developed abnormal changes in liver and other organs (no reference available for this but you should be able to source it from the Institute).

Wilkinson M J et al from Science Magazine October 2003. Hybridisation between Brassica napus and Brassica rapa on a national scale in the UK (shows the extent to which GM OSR will hybridise with wild relatives).

Recent research in Mexico compiled by ETC Group (contact: Sylvia@etcgroup.org). Shows the extent of GM contamination in Mexico including banned products such as Starlink.

Chowdhury et al from The National Institute of Animal Health etc. TSUKUBA, IBRAKI. Japan (2003). Detection of corn intrinsic and recombinant DNA fragments and Cry 1 Ab protein in the gastro-intestinal contents of pigs fed genetically modified corn. (This shows that transgenic DNA is not totally degraded in the gastro-intestinal tract of animals).

Sayyed A H et al from Department of Biological Sciences Imperial College London (Ecology letters 2003), titled "Could Bt transgenic crops have nutritionally favourable effects on resistant insects". (The larvae of resistant populations of the Diamond Back Moth may be using Cry 1 Ac toxin derived from Bt as a supplementary food protein. Bt transgenic

crops could therefore have unanticipated nutritionally favourable effects increasing the fitness of resistant populations).

Research from State University Ohio, US published in The New Scientist (Aug 2002). (Wild sunflowers crossed with GM sunflowers were unexpectedly found to become hardier and to have produced 50% more seed).

Benbrook C from ICTSD (2002) Economic and environmental impacts of first generation genetically modified crops: lessons from the US. (Looks at emerging issues that may impact performance of RR soya bean cultivars, and the mixed data on herbicide use and yields for RR soy, Bt cotton and Bt corn).

de Visser A J C et al from Plant Research International (Aug 2000) Crops of an uncertain nature. (Controversies and knowledge gaps concerning GM Crops).

DEFRA EPG 1/5/188. Modelling the effects of farmland food webs of herbicide and insecticide management in the agricultural eco system. (October 2003)

Henry c et al: Farm-scale evaluations of GM crops: Monitoring gene flow from GM crops to non-GM equivalent crops in the vicinity. Part 1 - Forage Maize. Ref EPG 1/5/138 (September 2003)

Squire G R et al: The potential for Oil Seed Rape feral (volunteer) weeds to cause impurities in later Oil Seed Rape crops (August 2003)

Ramsay G et al: Quantifying landscape scale gene flow in oil seed rape (October 2003)