

From Sir Brian Heap CBE FRS Foreign Secretary and Vice-President of the Royal Society

Response to the Policy Commission on the Future of Farming and Food

The Royal Society welcomes the invitation to contribute to the Policy Commission on the Future of Farming and Food. Unfortunately we are unable to provide a detailed response to such a wide-ranging topic in the time available. I note that you have been given a very limited timetable yourselves to address such an important and diverse subject. Below I have identified a number of issues that we think are key to creating a sustainable future for farming. I have also enclosed a number of our recent publications that I hope that you will find of interest. I would be happy to expand on these further if you wish or to provide further scientific advice on specific parts of your review if you think that it would be helpful.

Towards sustainable consumption

In attempting to create a sustainable farming and food sector, it is crucial to address the issue of sustainable consumption. The government should begin by considering what level of consumption is sustainable in respect of UK agricultural production, fishing and forests, what new science is relevant to improve the efficiency of production, and what new fiscal measures are needed. The UK should then encourage other members of the European Union to do the same, as part of the reform of the Common Agricultural Policy. This challenge is considered in some depth in *Towards sustainable consumption: A European perspective*¹, our contribution to the Inter-Academy Panel meeting on sustainable development in Tokyo last May.

Commitment to increasing competition

We are pleased to see from your terms of reference that you are addressing the issue of competition. We believe that a much stronger commitment is required by the government to considering how UK food production could be turned into a major UK export industry (such as has developed in the Netherlands) and that steps should be put in place to ensure that farmers tackle the opportunities to compete in the European and international markets. This is an area in which UK farming community under performs compared with some of its continental competitors. Continued investment in our excellent science base promises to keep us in the position of having one of the most advanced agricultural systems in the world but it is time that the export end was developed in a much more professional way. It would give enormous access to continental markets if done selectively. Unfortunately most farmers see no point and lack initiative, largely because the industry has never organised itself to take up the challenge in a major and cooperative way.

Farming and the environment

A specific commitment to address the conflict between agriculture and the environment should underpin any consideration of the future of agriculture in the UK. The recent Royal Society report on sites of special scientific interest² has highlighted the fact that agriculture is the largest single cause of damage to such sites in the UK. It is crucial that any proposed changes to

agricultural practice are subject to a rigorous scientific evaluation of their potential environmental impact. A similarly thorough assessment of proposed and existing agri-environment schemes is also required. A recent study found that a major agri-environment initiative in the Netherlands resulted in no significant increase in biodiversity³. This Dutch study highlights the difficulty in identifying how current agricultural practices should be modified to reduce their environmental impact and underlines the need for a close examination of the assumptions that underpin such schemes. Where appropriate these schemes should have specific targets for protecting or enhancing populations of individual species or groups of species that have an established indicator value. In addition, conservation related initiatives should be pursued in discussion with other interested parties to ensure complementarity with other measures. The Dutch study also highlights the importance of the comprehensive monitoring of these schemes after implementation. Crucial to both an understanding of the potential impact of changes in agricultural practices on wildlife and the monitoring of the actual impact is a supply of people with the ability to identify organisms of all types in the field and to understand their natural history. However there is concern that the number of people with this ability is declining and collaboration with the scientific community and research funders will be necessary to ensure that these skills are not lost.

Climate change

Any sustainable strategy for farming must be compatible with the need to reduce the concentration of greenhouse gases in the atmosphere and should also take into account the potential impact of climate change on the sector. In 1990 the agricultural sector accounted for around 12% of the UK's total greenhouse gas emissions⁴. We are aware that the government has already taken some successful steps to reduce these emissions, by encouraging farmers to reduce the application of nitrogen fertilizers for example, but more must be done. As well as being a source of emissions of greenhouse gases, agricultural land can of course play a role in reducing them. The planting of biofuel crops such as perennial grasses or short rotation coppice of willow can temporarily increase the amount of carbon stored in the soil of new forests and can produce a more permanent reduction in greenhouse gas emissions by replacing fossil fuels in power stations. The commercial planting of biofuel crops has been advocated for over a decade. We therefore welcome the new schemes to promote the planting of biofuel crops that have recently been introduced by UK government⁵ as part of their plan to promote renewable energy sources, but question whether they are on a scale that will have a real effect. As with any agri-environment scheme we recommend that they be rigorously assessed to determine their full environmental impact. We address this in more detail in our recent report on the role of land carbon sinks in mitigating global climate change⁶ in which we recommend that, in the light of the proposed reform of the Common Agricultural Policy, consideration be given to strategies that encourage the carbon mitigation potential of agricultural land throughout the EU. Finally, the recent report from the Intergovernmental Panel on Climate Change⁷ has underlined the need to consider the potential impact of climate change on all sectors, including the farming sector. Impacts may include the changes to the length of the growing season, an increase in damage to crops caused by extreme weather events and changes in the identity and incidence of pests and diseases.

Issues surrounding GM technology

The use of genetically modified (GM) plants and animals has the potential to offer real benefits in agricultural practice, food quality, nutrition and health in both the developed and developing world. However there are uncertainties about several aspects of GM technology and those involved in the technology, whether in the development of legislation or in the application of the scientific developments, must engage in an open and frank debate with the public and recognise the concerns about the issues. We have previously recommended that this be a priority activity for the Agriculture and Environment Biotechnology Commission⁸. We will increasingly play a role in engaging the public in dialogue on subjects such as the role that GM technology might play in a sustainable agricultural sector.

Our recent report on genetically modified animals⁹ has identified the need for detailed analyses of the genetic control of normal muscle growth, development and physiology in animals so that any genetically altered trait is consistent with good welfare, in both GM animals and also in animals bred via selective breeding techniques. Consequently, we have recommended that the government fund research into the welfare implications of GM animals for agricultural use. However we believe that it is likely to be at least a decade before large animals with modified or deleted genes of commercial value have been evaluated and approved by the various regulatory bodies. GM crops are much further advanced but there is considerable public concern about GM technology, particularly with respect to the safety of GM food for human consumption and to the possible effects of the technology on the environment. We are currently updating our previous statement on GM plants¹⁰ to address some of the concerns about potential health impacts and I will ensure that a copy is sent to you when it is available.

Interaction between the Policy Commission and other Inquiries

As you will be aware the Royal Society is undertaking the Inquiry into infectious diseases of livestock that aims to report its findings, some of which will undoubtedly have implications for the future of farming, in Summer 2002. This will be too late to inform your report but I hope that you will be recommending that the government wait for the outcome of all three inquiries before it develops a strategy for the future of farming in the UK. We have recently advised DEFRA to wait until the conclusions of all three inquiries are available before finalising its aims and objectives¹¹.

Scientific capacity

In the sections above we have highlighted the need for rigorous scientific research to inform the many decisions that must be made to achieve a sustainable future for farming in the UK. Crucial to this is the need to retain high quality basic and applied agricultural research capacity and to ensure that the results of such work are available (in an accessible format) to both decision makers and the public. The need to fully resolve the problems of BSE and to develop novel foot-and-mouth vaccines further emphasise this requirement. The Royal Society will continue to play its role in providing advice but it should be recognised that expertise will have

to be bought in from abroad if the current policy of reduced support for agricultural research continues.

I hope that you have found these comments constructive. Please do not hesitate to contact me should you require additional clarification on any of these issues or additional scientific advice at a later stage of the review.

¹ Heap, B & Kent, J (eds) 2000. *Towards sustainable consumption: A European perspective*. London: The Royal Society. ISBN 0 85403 537 0

² Royal Society (2001) *The Future of Sites of Special Scientific Interest (SSSIs)* ISBN 0 85403 552 4. Available from the Royal Society or at <http://www.royalsoc.ac.uk/policy>

³ Kleijn et al (2001) Agri-environment schemes do not effectively protect biodiversity in Dutch agricultural landscapes *Nature* **413** 723-725

⁴ *Climate Change - The UK Programme DETR 2000 Cm 4913*

⁵ The Energy Crops Scheme is run by the Department of Environment, Food and Rural Affairs (previously Ministry of Agriculture, Fisheries and Food) in partnership with the Forestry Commission. Further details can be found at <http://www.maff.gov.uk/erdp/guidance/energydet/energyindex.htm>

⁶ Royal Society (2001) *The role of land carbon sinks in mitigating global climate change*. Ref 10/01. Available from the Royal Society or at <http://www.royalsoc.ac.uk/policy>

⁷ Intergovernmental Panel on Climate Change (2001) *Third Assessment Report*. Cambridge University Press

⁸ Royal Society (2000) *Response to the consultation on the work plan for the Agriculture and Environment Biotechnology Commission*. Available from the Royal Society or at http://www.royalsoc.ac.uk/policy/letter_aebc.pdf

⁹ Royal Society (2001) *The use of genetically modified animals*. Ref 05/01. Available from the Royal Society or at <http://www.royalsoc.ac.uk/policy>

¹⁰ Royal Society (1998) *Genetically modified plants for food use*. Ref 02/98. Available from the Royal Society or at <http://www.royalsoc.ac.uk/policy>

¹¹ Royal Society (2001) *Response to the consultation on the aims and objectives of the new Department for Environment, Food and Rural Affairs*. Available from the Royal Society or at <http://www.royalsoc.ac.uk/policy>