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# Guest editorial: Livestock and global climate change

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Livestock production occupies 70% of agricultural land, and 30% of the ice-free land surface of the planet (Steinfeld *et al*., 2006). Livestock production is responsible for 40% of global agricultural gross domestic product, is central to the livelihood of some of the world's poorest people, and is both a contributor to global environmental problems, and part of the solution.

Global demand for livestock products is expected to double during the first half of this century, as a result of the growing human population, and its growing affluence (Steinfeld *et al*., 2006). Over the same period, we expect big changes in the climate globally. The expansion of crop production for biofuels has already impacted on the resources available globally for food production, and hence on food supply and cost. Climate change is expected to impact further on agricultural productivity, often adversely, in many parts of the globe (IPCC, 2007). Food security remains one of the highest priority issues in developing countries, and livestock production has a key role in many of these countries. However, food security has re-emerged as an important global issue that must concern both developing and developed countries. These interconnected issues are creating immense pressure on the planet's resources. We need high quality animal science to help meet rising demand for food in an environmentally and socially responsible way.

Against this backdrop, the British Society of Animal Science, INRA (Institut National de la Recherche Agronomique), the European Association for Animal Production, ICARDA (International Center for Agricultural Research in the Dry Areas) and many other partners and sponsors, organised a conference on *Livestock and Global Climate Change*, held at Hammamet, Tunisia in May 2008. The conference organisers felt that there was an urgent need to bring interested parties together to review the latest scientific findings on predictions of climate change and how these will affect livestock production, to examine the contribution that livestock production makes to these changes and how it can help to mitigate them, to consider how livestock production systems can adapt to climate change and to consider future scientific priorities to help in these areas. The growing governmental and public interest in livestock production and climate change – and the often polarised and partial debate on the issues – reinforces the need for sound scientific evidence and thoughtful interpretation.

Discussions at the Tunisia conference concluded that substantial investment in animal science is needed to develop livestock systems that minimise greenhouse gas emissions, and are adapted to global climate change, while contributing more efficiently to growing global food needs. They also highlighted the importance of basing future advice on living with climate change, on real data about livestock systems globally, including measuring emissions, rather than relying solely on predictions. It is also vital that we consider these issues in the wider global context of cost and access to food, other environmental impacts, food *v.* fuel and international development. This means much more joint working between livestock, plant and soil scientists, economists and sociologists to tackle these major global issues.

This issue of *Animal* includes several papers based on presentations at the Tunisia meeting. The paper by Gill *et al*. (2010) reviews the role of livestock in mitigating climate change and highlights the need for better, more holistic evidence on the competing challenges of food security and mitigating climate change. The ability of ruminants to convert grass and other plant material that is unsuitable for humans to high-quality food, especially on land unsuitable for other cropping, will undoubtedly play an important part in meeting these challenges. The paper of Soussana *et al*. (2010) reviews the evidence on carbon sequestration by grasslands, and the practices that maximise this important benefit. Martin *et al*. (2010) review proven and potential technologies to control methane emissions by ruminants. Wall *et al*. (2010) examine how genetic selection of livestock can contribute to reducing emissions at the animal or system level. One of the major challenges in adapting to climate change will be dealing with the new livestock and crop disease challenges that this brings. Van Dijk *et al*. (2010) argue that in temperate regions one of the major impacts of climate change will be increased exposure of livestock to helminth parasites, and they discuss control strategies and future research needs. The paper of Gerber *et al*. (2010), on policy options in addressing livestock's contribution to climate change, is based on a presentation at the 2007 European Association of Animal Production meeting at Vilnius (additional material from a paper at the same meeting is included in the paper by Martin *et al*. (2010)).

The papers in this issue of *Animal* will make a very valuable contribution to informing the debate on the role of livestock in living with environmental change. I hope that

they will also stimulate more animal scientists to become engaged in this increasingly important area.

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