228

Dynamic drivers of disease in the Scottish livestock sector: An application of a multi-sector, spatial partial equilibrium model

Luiza Toma[1], Karl M. Rich[2], Paul Bessell[3], Aaron Reeves[4], Iain McKendrick[5], Mark Bronsvoort[3], Lisa Boden[6], Harriet Auty[1], Alistair W. Stott[4], **George J. Gunn**[7], [1]SRUC, Edinburgh, United Kingdom; [2]Lab 863 Ltd., Edgware, United Kingdom; [3]University of Edinburgh, Edinburgh, United Kingdom; [4]SRUC, Edinburgh, United Kingdom; [5]BIOSS, Edinburgh, United Kingdom; [6]University of Glasgow, Glasgow, United Kingdom; [7]SRUC, Inverness, United Kingdom. Contact: George.Gunn@sruc.ac.uk

Purpose

Farm-level decisions to control animal diseases are influenced by a variety of policy, macroeconomic, and environmental phenomena. Changes in these factors can influence the trajectory of animal disease status over time, with subsequent impacts on the evolution of the livestock and feed sectors of the economy.

A qualitative assessment of different drivers of change and horizon scanning identified emerging disease threats in the Scottish cattle and sheep sectors. The drivers in this analysis focused on Scottish legislative changes related to technological uptake and changes to Scotland's international trade policies due to the European Union's Common Agricultural Policy reform. This analysis was informed by focus-group discussions with key informants to identify trajectories of change. Validation of these results with simulation analysis is useful to tease out the specific impacts of such changes.

Methods

We use a multi-sector, spatial partial equilibrium model that was adapted for the Scottish livestock sector to forecast the dynamic sector-level impacts of major drivers of change on the disease status of the Scottish livestock industry. These drivers of change are built into modelling scenarios, which were fine-tuned using results of a recent (2013) representative survey of Scottish livestock farmers analysing farmers' uptake behaviour of animal health technologies and intentions to continue/leave/change size of business during the current CAP reform.

Results

Under the scenario of high technology uptake and partial trade liberalisation, results indicate an increase in Scottish livestock production, an increase in exports and reduced dependence on imports, although this depends on maintaining strong disease control measures. Alternatively, where low technology uptake is combined with full trade liberalisation, results indicate lower domestic production, based on increased competition with cheaper imports and introduction of disease from imports from countries with high prevalence of disease.

Conclusions and relevance

Preliminary results illustrate some of the nuances associated with drivers of structural change informed by multi-sector modelling.