Possible changes in EU livestock density over next 20 years

A new combination of three models has explored the future dynamics of European livestock distribution. The results indicate that, without environmental policy, livestock density will increase both inside and outside current livestock hotspots. This will also occur to a certain degree with regulation, but the risk of negative impacts will be less likely.

The European livestock sector has changed a great deal in the recent past and more changes are expected with reforms to the EU Common Agricultural Policy and increasing implementation of environmental policy. The study focused more on the pressures from high density, intensive farming, and less on livestock farming in extensive areas, which generally does not put pressure on the environment and plays an important role in supporting biodiversity. In order to explore the possible impacts of livestock farming, the study took a novel multi-scale modelling approach. This combined three models at different spatial levels that considered a range of driving factors, such as trade policies, climate, livestock management, socio-economic factors and land cover. Six types of livestock and four future scenarios were considered which varied with the level of market globalisation and environmental regulation. The models were run from 2010 up to the year 2030.

The results indicate that, under the conditions studied, the majority of older EU Member States (EU-15) will generally experience a decrease in livestock with a strong decline in ruminants (cattle, sheep and goats). In the newer Member States, there is expected to be a decline in sheep, goats and pigs, whereas numbers of beef cattle and poultry are expected to grow.

The decrease in livestock numbers appeared to be greatest in a modelling scenario with high implementation of environmental legislation and greater globalisation of livestock markets. In this scenario, there was an estimated 45 per cent decrease in beef cattle and a 37.8 per cent decrease in sheep in EU-15. The legislation considered by the model was the Water Framework Directive, Nitrates Directives and Less Favoured Areas support. Policies, such as the High Nature Value Farmland areas policy, that support agricultural systems that maintain biodiversity were not considered. This has implications for the results as this type of policy may allow for the maintenance of livestock numbers whilst also protecting the environment.

In general, the main hotspots for livestock production are expected to remain in the same areas, such as the Po-valley, Brittany, the Netherlands and Belgium. Where increases in livestock did occur (i.e. new Member States), it appeared to be mainly in regions with large scale grassland and fodder areas. In these areas it appears that if there is a high implementation of legislation then it will prevent livestock reaching levels that might cause negative environmental impacts, i.e. the legislation is effective as long as it implemented. However, again it should remembered that not all regulation was considered.

The research provides insight into the possible distribution of livestock in the future and the impact of legislation. Its strength lies in its ability to link models that work at different spatial scales and therefore can help evaluate large areas, which cannot be done with field-based studies. However, it does have some limitations. For example, some assumptions were based on expert knowledge rather than hard figures as there were gaps in the data. Another limitation, as mentioned above, was that it did not include all policies of relevance, such as the High Nature Value Farmland areas policy. For research to progress in this area, an improvement in European agricultural monitoring, evaluation of policy and the collection of spatially detailed data on livestock is needed.


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Theme(s): Agriculture