

Extended Abstract

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Paper Title	Does reducing suckler cow numbers equate to reducing GHG emissions? Regional and environmental outcomes of suckler herd reduction in Ireland.
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Abstract prepared for presentation at the 96th Annual Conference of the Agricultural Economics Society, K U Leuven, Belgium

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Abstract	<i>200 words max</i>
<p>The Climate Change Advisory Council (2019) recommended reducing suckler cow numbers by up to 50% in order to reduce Irish agricultural GHG emissions and achieve carbon neutrality by 2050. Due to strong regional differences existing within the distribution and dependency on suckler cows in Ireland, both the economic performance and the climate efficacy of such policy proposals should be critically examined at a regional level in order to inform policymakers as to the potential regional implications. At present, the CAPRI model uses NUTS 2 classifications for Ireland, but the localised impacts of policy changes are not clearly visible in the model output.</p> <p>The aim of this study is to examine the possible impacts of policy changes on the Irish suckler herd at a more localised level. Using the CAPRI model with a newly developed NUTS 3 classification for Ireland, three scenarios of 15%, 30% and 50% suckler herd reductions were chosen relative to 2018 levels. The findings suggest that distinct regional variances exist with regards to herd size, supply, income and prices when offsetting agricultural GHG emission through the reduction of the suckler herd by 2030 and that certain regions such as the West and Border will be adversely affected more than others.</p>	
Keywords	CAPRI Model, NUTS 3, Regional Analysis, Irish Agriculture, Suckler Farming
JEL Code	C54 Quantitative Policy Modelling, Q10 Agriculture General, Q18 Agricultural Policy; Food Policy see: www.aeaweb.org/jel/guide/jel.php?class=Q)
Introduction	<i>100 – 250 words</i>
<p>Despite Ireland's overall country mass being relatively small, Irish agriculture has high levels of national specialisation as well as distinct spatial patterns. There has been increasing emphasis placed on environmental sustainability at both an EU and Irish level over the last two decades and has become particularly relevant with the Irish government commitment to becoming Carbon Neutral by 2050. Ireland's agricultural sector accounted for 33.3% of National GHG emissions in 2017 and is the most</p>	

significant sector contributing to Ireland's GHG emissions (Quirke et al., 2018). Currently, the NUTS 2 classifications used by Ireland of two regions of the Southern and Eastern region and the Border, Midland and West region shows little regional variation when policy reform is examined. However, within these NUTS 2 regions, there is a considerable variation in terms of soil type, farm type and stocking rates; this creates a diverse range of agricultural activities and production.

The Climate Change Advisory Council (2019) recommended reducing suckler cow numbers as a means to reduce agricultural GHG emissions in Ireland. It has been acknowledged in the literature while low-intensity farming such as suckler farming is less profitable, the removal of these sectors would have negative impacts on both the socio-cultural cohesion, the local economic stability as well as ecological integrity of these regions (Kramm et al., 2021). Therefore, to examine the possible impacts of policy changes at a more localised regional level, a NUTS 3 model for Ireland has been used in the CAPRI model to simulate the regional effects of reduced suckler cow numbers for 2030.

Methodology

100 – 250 words

The CAPRI model is a quantitative partial equilibrium model with a specific focus on the agricultural sector that provides a valuable predictive framework to better understand the possible outcomes of agriculture policy reform. It allows for economic, environmental and trade impacts of proposed policy changes to be analysed and responded to appropriately as a result. The model consists of two interacting modules: a supply module and a market module. The supply module comprises of independent aggregate optimisation models representing agricultural activities in all NUTS 2 regions within the EU. The market module consists of a spatial, global multi-commodity model for 47 primary and processed agricultural products, covering 77 countries in 40 trade blocks.

This study has incorporated data at the NUTS 3 regional level for Ireland into the CAPRI model to enable the simulation of more accurate localised effects of policy changes. Data from the NUTS 3 regions is incorporated into CAPRI for Ireland using seven NUTS 3 regions these are Border, West, Mid-West, South-East, South-West, Dublin and Mid-East and Midlands.

A detailed policy representation of the EU agriculture sector is included and measures within the CAP are covered (2014-2020 reform). This does not anticipate any potential WTO agreement and bilateral trade agreements. For 2030, the model generates a baseline that constitutes the reference scenario against which the three suckler herd reduction scenarios are compared. In the reference scenario, no reduction of the suckler herd is set. Under scenario one, a 15% reduction of the suckler herd is achieved; under scenario two, a 30% reduction is achieved, and under scenario three, 50% reduction is achieved, all relative to 2018 levels.

Results	100 – 250 words
<p>Under scenario one, the suckler cow numbers decline by 15% relative to 2018 (from 1,015,000 suckler cows to 863,000). Total agricultural emissions are projected to be 19.2 Mt CO₂ eq in 2030, or 2.9% greater than 2005 levels and 1.7% below 2017 levels. Under scenario two, the suckler herd declines by 30% relative to 2018 (from 1,015,000 suckler cows to 711,000). In this scenario, total agricultural emissions are projected to reach 18.5 Mt CO₂ eq, or 0.9% below 2005 and 5.4% below 2017 levels. Under scenario three, the suckler herd declines to pre-Milk Quota (1984) levels (from 1,015,000 suckler cows to 479,000), a 50% decline. Accordingly agricultural emissions are projected to reach 17.4 Mt CO₂ eq in 2030, 10.9% less than 2017 levels.</p> <p>The distinct regional variances (herd size, supply, income and prices) when offsetting agricultural GHG emission through the reduction of the suckler herd are apparent. The regions of West, Mid-West, Border and Midlands are more adversely affected compared with areas such as South-East, Dublin and Mid-East. Average herd size variance occurs in the Border Midlands and West regions at 47 cattle whereas in South and East region it is 87 cattle; this latter group will experience a sharper decline in income. This leads to an increase in sheep flock size and dairy herd size as farmers move from suckler production and hence the reduction in GHG emissions from the suckler cow herd is in part offset by increased emissions from other sectors. As structural change is not considered in CAPRI, changes in the number of farmers are unknown.</p>	
Discussion and Conclusion	100 – 250 words
<p>Considerable regional differences exist in both the economic and the climate efficacy of agricultural production and output. While agriculture is an important part of the Irish economy, the extent of this importance differs in each local region. The average beef herd size is 87 cattle; however, this varies significantly regionally. Through the analysis of the three scenarios, large regional variations are apparent. Due to the specific regional specialisation of Irish agriculture, not all regions will be affected equally as a result of these proposed policy changes. This study demonstrates that the regions of West, Mid-West, Border and Midlands are more adversely affected as these regions are characterised by many small suckler farms and there may also be a large impact on the local rural communities in which they are set.</p> <p>The regional implications of such reductions on the local economies in which these suckler herds are established have not previously been considered. While low-intensity farming such as suckler farming is less profitable, the removal of these sectors would have negative impacts for the sustainability of these regions. An interesting note from the reduction of the suckler herd is that in the regions where the suckler herd reduces there is an increase in sheep and dairy production. The aim of the policy change is to reduce GHG emissions by reducing suckler cow numbers, but the outcome will be that there is a partial offsetting of GHG emissions reduction experienced by increased emissions from other sectors including sheep and dairy cows.</p>	



References

Climate Change Advisory Council, 2019. Annual Review 183.

Kramm, N., O'Rourke, E., Chisholm, N., 2021. Modelling the Impact of Land Use Decisions on Agriculture, Biodiversity and Socio-Economic Development of the Irish Upland Commons.