## Extended Abstract
## Please do not add your name or affiliation

| Paper/Poster Title | An Assessment of farmers perceptions of alternative Greenhouse Gas emissions mitigation technologies |
|---|---|

**Abstract prepared for presentation at the 97th Annual Conference of the Agricultural Economics Society, The University of Warwick, United Kingdom**

**27th – 29th March 2023**


| **Abstract** | ***200 words max*** |
|---|---|
| This study examines the attitudes of Irish beef and dairy discussion group members to a range of agricultural greenhouse gas (GHG) emissions mitigating measures. A farmer survey was conducted across three regions in Ireland, the South, South-East and Border Midlands West (BMW). Farmers were presented with a range of mitigation measures and ask to rank these on a Best-Worse scale. A balanced incomplete block design was used with 11 treatments (mitigation technologies), 11 blocks and 5 treatments per block, with each treatment appearing 5 times. The findings indicate that farmers are more likely to adopt cost-effective mitigation measures but not if they are unfamiliar with the technology. In order to encourage mitigation of GHG emissions on Irish farms, farmers need to be better educated on agricultural GHGs, mitigation measures and the associated benefits. | |



| **Keywords** | Greenhouse Gas Emissions Abatement Strategies |
|---|---|
| **JEL Code** | Q18, Q54<br>see: www.aeaweb.org/jel/guide/jel.php?class=Q) |


| **Introduction** | ***100 – 250 words*** |
|---|---|

The Climate Act approved by the Irish government in October 2021 has identified sectoral targets to achieve a 51% reduction in total Irish Greenhouse Gas (GHG) emissions. As part of this emissions reduction objective, the agricultural sector has been assigned an emissions reduction target of 25%. If widely adopted abatement strategies would have the potential to reduce agricultural emissions by up to 15% in 2030 compared with projected emissions under a business as usual scenario (Lanigan and Donnellan, 2019). However, the adoption of these technologies is a complex decision that will depend on a wide variety of factors including the nature of the characteristics of the technology, the direct cost of the measure, the impact of the measure on farm performance and profitability, the farmers managerial ability, their perceptions accurate or otherwise of these measure, as well as the contribution of agricultural extension agents in communicating the extent of the problem to farmers as well as the range of abatement measures available. These factors will influence farmers relative preferences for implementing different technologies. This paper reports the findings of a farmer survey and focus groups that explore farmers awareness of and attitude towards agricultural GHG emissions as well as their preferences relating to GHG emissions abatement measures and the factors that

shape these preferences. Finally, farmers stated preferences with regards to different measures are compared with data on the actual uptake of measures.

| **Methodology** | ***100 – 250 words*** |
|---|---|

A mixed method approach was used in order to capture both quantitative and qualitative data pertaining to farmers attitudes towards alternative abatement technologies. A survey was administered at dairy and beef farmer discussion groups to establish their existing knowledge level on GHG emissions from agriculture in Ireland and their opinions in relation to the adoption of practices to reduce emissions. As part of the survey participants were presented with 11 different abatement measures to rank using a best-worst scaling method. The best-worst scaling (BWS) method is used to measure farmers preferences for GHG mitigating technologies and which options may need to have additional information and support provided. This method measures the location of each option along a scale according to degree of interest (Goodman, 2005). By using this method, it allows us to develop an ordinal ranking according to the respondent's preferences which simplifies the analysis process and allows for direct comparisons between options (Goodman, 2005). In each BWS task, respondents were asked to identify the best and worst option of GHG mitigating technologies for their own farms. For the purpose of this study, in the BWS a balanced incomplete block design was used with 11 treatments (mitigation technologies), 11 blocks and 5 treatments per block, with each treatment appearing 5 times. After the questionnaires had been completed and analysed two semi-structured focus groups were conducted to discuss the mitigation measures. These focus groups explored the barriers to adoption of specific measures.

| **Results** | ***100 – 250 words*** |
|---|---|

Improving live-weight gain of beef animals was the most popular option amongst beef farmers with the highest best count at 99 and the lowest worst count at 7, while the use of treated urea was the most unpopular among farmers as they have the lowest best count at 8 and the highest worst count at 98. In contrast, other measures such as implementing a herd health programme and increasing clover content in the sward appeared to divide opinion amongst beef farmers as they showed worst counts nearly as high as their best counts. Beef farmers typically ranked the most cost-effective measures highest, which is unsurprising given the low returns to beef production. Amongst dairy farmers "extending grazing season length" had the highest net score followed by improving the EBI of the herd and timing of slurry application. As was the case in the beef best-worst, overall, the dairy farmers tended to prefer the more cost-effective mitigation measures as also stated by Vellinga et al. (2011) and Barnes and Toma (2012). This is with the exception of low-emission slurry spreading as it was ranked the least cost-effective but was the fourth most popular measure amongst the dairy farmers surveyed. Planting of forestry was the least popular measure amongst dairy farmers and the third least popular amongst beef farmers.

| Discussion and Conclusion | *100 – 250 words* |
|---|---|

In terms of farmer preferences for technologies it was clear that there was less preference for newer or lesser known technologies such as use of dietary additives and use of treated urea. It is also possible that the cost-effectiveness of some measures (in particular the more newly developed ones) is not fully appreciated by farmers, as some farmers expressed surprise at the potential savings to be made as a result of the measures included in the Carbon Navigator. Planting of forestry proved to be a particularly unpopular option amongst the farmers surveyed and is in line with the recent downward trend in farm afforestation in Ireland. Previous studies have found that many farmers perceive afforestation as an activity only suitable to more marginal land and this combined with the perpetual nature of farm forestry has led to low rates of afforestation in recent years.