

Extended Abstract

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Paper/Poster Title	The Role of Innovation in Nitrogen Use efficiency on Irish Dairy Farms
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Abstract prepared for presentation at the 98th Annual Conference of The Agricultural Economics Society will be held at The University of Edinburgh, UK, 18th - 20th March 2024.

Abstract	200 words max
<p>Nitrogen Use Efficiency (NUE) is an important factor in protecting our watercourses and increasing farm level profitability. There are a number of ways that farmers can improve NUE on their farms including when, where and how chemical N is applied to the land. Innovations that can lead to increased sustainability may be newly developed or applied technologies, or may arise from the adoption of established or newly developed management techniques. Therefore, it is important to assess the adoption of these innovations and the extent to which advancing science and knowledge is implemented in real-world farming practices. In this study we examine the role of low emission slurry spreading, the percentage of slurry spread between January and April, and the percentage of Nitrates in feed concentrates as innovations which can increase NUE on dairy farms in Ireland</p>	
Keywords	e.g. Bioenergy, Energy Efficiency
JEL Code	e.g. Energy: Demand and Supply Q41 see: www.aeaweb.org/jel/guide/jel.php?class=Q)
Introduction	100 – 250 words
<p>Irish dairy systems are primarily a grass based production system with cows grazing outside for most of the year. Grassland management is therefore an essential element of Irish dairy production systems, and Irish dairy farmers are reliant on Nitrogen (N), both chemical and organic, to ensure an adequate supply of grass during the grazing season and to produce grass silage for the housing period. However, excess application on N fertilizers can have an adverse effect on the environment, in particular, high N surpluses have the potential to run off into watercourses and have a negative effect on water quality. The declining trend in water quality in Ireland, as highlighted by the Environmental Protection Agency has been attributed to the agricultural sector. Of particular concern is the expansion of the Irish dairy sector since milk quotas were removed in 2015 and between the years 2015 and 2023 the dairy herd has increased by 27%. While there has been a decrease in the less profitable suckler herd of 18% the total number of cattle in Ireland increased by 5% over the period. In terms of agricultural sustainability, protecting farm incomes while also protecting natural resources such as water requires farmers to make efficient use of fertilizers applied.</p>	
Methodology	100 – 250 words

Using Teagasc National Farm Survey data from 2015 to 2022 we apply a panel data fixed effects model to capture the effect of different innovations on NUE on Irish Dairy farms.

Results

100 – 250 words

Innovations, which include low emission slurry spreading, the percentage of slurry spread between January and April, and the percentage of Nitrates in feed concentrates are found to be highly significant drivers of Nitrogen Use Efficiency on Irish dairy farms

Discussion and Conclusion

100 – 250 words

The use of LESS equipment is significant in terms on increasing NUE on both derogation and non-derogation dairy farms. Larger farms with higher stocking rates have a higher NUE.