



Stormy weather



TEAGASC research is assessing the impact of extreme weather on farm-purchased concentrate feed on Irish dairy and beef farms.

Introduction

Grass productivity is key to farm profitability in Irish livestock production and farmers plan their farm operation to match grass growth rates. Farms make the most of grass from mid spring to mid autumn, and when grass growth exceeds cattle demand in summer, the extra grass is taken out as silage and hay for the winter. If bad weather disrupts this pattern, pasture production, and thus farm competitiveness and animal performance, are threatened. In a normal year, feed costs (concentrates, pasture and forage) account for 40% and 75% of the total direct costs in dairy and beef farms, respectively. This research aims to understand and quantify the relationship between variations in purchased supplementary concentrate feed and seasonal weather extremes on Irish dairy and beef farms.



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Research approach

Using the Met Éireann climate reanalysis dataset (MÉRA), in combination with the Irish National Farm Survey (NFS), we could relate extreme seasonal weather events to farm feed use using econometric regression models. We used NFS farm data from 125 specialist spring-calving dairy farms and 87 specialist beef farms for the period 2001-2015. Climate indices are widely used to identify the moderate to severe extreme weather events on long-term climate data. In this study, a percentile-based method was used to determine the seasonal number of very warm days (maximum temperature > 95th percentile), very cold days (minimum temperature < 5th percentile) and very wet days (precipitation > 95th percentile), with respect to a baseline climate. We hypothesised that the purchase of concentrate feed is a function of both the current spring weather and the previous grass-growing season's weather. Therefore, the farm statistics from May to April were used instead of the calendar year (January to December) statistics as given in the NFS. Variation in purchased feed across farms and over time in relation to weather and other important farm variables, such as livestock units and farm size, was analysed using a panel model.

Results

Our research revealed that seasonal extreme weather has a negative effect on Irish dairy and beef farms as it increases concentrate feed purchases (**Table 1**). While effects differ between farming systems, with dairy farms generally purchasing more supplementary feed as a result of extreme weather when compared to beef farms, the research reveals that extreme weather at the end of the housing period in spring, but also in the year preceding the housing period (November to April), is significantly affecting feed purchase in both farming systems.



This highlights the importance of the previous year’s summer and autumn weather, and its effects on grass growth, the length of the grazing season, and silage stores for the current year.

Conclusion

The increased dependency on concentrates, together with the increase in the frequency of local and global extreme weather, could affect dairy farm costs considerably in the coming years. The relationship between extreme weather and farm feed purchases described in this research can be used to develop a forecast model to quantify and anticipate the fodder needs for

Table 1: The extreme seasonal weather that significantly affects feed purchases on Irish dairy and beef farms. The size of the effect was estimated with a panel model and significance was established if the fit of the model had a p value < 0.05. LU = livestock unit.

| SEASONS | DAIRY FARMS | BEEF FARMS |
|---|--|--|
| Previous year’s summer weather (May-July) | One very wet day in summer increases housing period concentrate usage by 4.42 kg/LU | |
| Previous year’s autumn weather (August-October) | One very warm day in autumn decreases housing period concentrate usage by 3.57 kg/LU | One very warm day in autumn decreases concentrate usage by 2.78 kg/LU One very wet day in autumn increases concentrate usage by 3.6 kg/LU |
| Current year’s spring weather (March-April) | One very cold day in spring increases housing period concentrate usage by 8.76 kg/LU | One very warm day in spring decreases concentrate usage by 1.92 kg/LU |

the national herd, thus allowing better preparation for fodder shortages as a result of extreme weather, and development of more robust spatio-sectoral farming strategies to adapt to weather variations.

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