Update from the Signpost Demonstration Dairy Farmers

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Summary

1. The Signpost dairy farmers have adopted many of the climate mitigation technologies recommended by Teagasc, but there still exists scope to further reduce GHG emissions on these farms.
2. The Signpost Programme has identified 12 Steps to reducing gaseous emissions on dairy farms and recommends that all dairy farmers check their position regarding each of the recommended actions.

Background

The Signpost Programme is designed to support and enable dairy farmers to farm more sustainably. This paper aims to benchmark the uptake of recommended climate mitigation practices for the dairy farms participating in the programme and describe changes over the first 24-month period (2021, 2022). These Signpost dairy farmers were not selected to be representative of the "typical dairy farmer" and operate at a higher level of productivity and profitability relative to the average National Farm Survey dairy farmers.

Results

There was a high level of technical performance on the 38 Signpost dairy farms in 2022 with an average milk solids output of 498 kg per cow using 173 kg of chemical nitrogen per ha and feeding 1,189 kg concentrates per cow. Similar to other dairy farms, on average Family Farm Income per hectare increased during 2022, largely due to higher milk prices (although costs also increased).

Looking at the usage of the recommended 12 steps to reducing emissions, Table 1 shows:

- These farmers are using protected urea as a source of more than half of their fertiliser N, but that there is still scope to increase its usage. Availability was an issue in 2022.
- These farms were extensively soil sampled in early 2022, and the farmers have used the results to target lime applications during both 2021 and 2022, with 77 tonnes spread per farm in 2022.
- Four out of ten soil samples had the correct soil pH, P and K. This is higher than is the case on a typical dairy farm (2 in 10 samples for 2022).
- There has been complete adoption of LESS by this group of farmers.
- These farmers have started the transition to a lower dependence of fertiliser N use, with fertiliser N usage 12% lower in 2022.

- Signpost dairy farmers utilised 12.0 t DM grass / ha last year with many exceeding the target of 12t DM grass utilised / ha.
- Milk was produced with a low SCC of 124,000 cells/ml on average.
- Herd EBI increased by €10 in 2022 and milk solids production was high on these farms at 498 kg/cow.
- On average these farmers achieved a 21% replacement rate in 2022, with their replacements calving at an average age of 24.2 months.
- The DBI of the sires used was €71 in 2022 with considerable scope for improvement.
- Finally, 86% of these farmers have incorporated clover into reseeds in 2022, setting them up for further reductions in chemical N use.

Table 1: Performance of Signpost dairy farms for 2022

		2022	**Target**
Family Farm Income €/ha		3,401	-
12 steps to reduce gaseous emissions			
Step 1	% total chemical N as protected urea	54	> 90%
Step 2	Lime usage t per farm	77	Soil pH 6.2+
Step 3	% samples with agronomic optimum soil fertility	42	90
Step 4	% slurry spread using LESS	99	100
Step 5	kg chemical N / ha	173	150
Step 6	tonnes DM grass utilised	12.0	12.0
Step 7	SCC, ,000 cells/ml	124,000	150,000
Step 8	EBI, € increase per year	+10	+10
Step 9	Milk solids, kg/cow	498	480
Step 10	Herd replacement rate % Age at first calving months	21 24.2	18 24
Step 11	DBI of beef sires € in 2022	71	150+
Step 12	% of farms incorporating high clover mix into reseeds	83	
Environmental Sustainability			
Total farm emissions t CO_2-e (IPCC[1])		974	-
Emissions t CO_2-e per ha (IPCC)		10.4	-
Emissions kg CO_2-e per kg FPCM (LCA[2])		0.87	0.76

[1]IPCC = intergovernmental panel on climate change; [2]LCA = life cycle assessment;

Conclusion

Considerable progress has been made on the Signpost dairy farms to implement the 12 steps to reducing greenhouse gas and ammonia emissions. There is more potential to further reduce total GHG emissions on the Signpost farms by further reducing chemical nitrogen use and increasing the proportion of their chemical N applied as protected urea. Improving both the pace and scale of adoption of climate mitigation technologies is the major focus for the Signpost Programme, both on the Signpost Farms and on all dairy farms.