

CROP NITROGEN BALANCE IN DAIRY FEEDING SYSTEMS IN THE NORTH-WEST OF SPAIN



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INTRODUCTION

Crop N balance and crop N use efficiency takes into account N input via fertilizers, soil supplies and N fixation and N output via uptake by crops.

Crop N balance is an important indicator of agricultural sustainability, because surplus nutrients can pollute soil, water and air and indicates economic inefficiency.

The aim of this study was to determine and compare crop N balance and crop nitrogen use efficiency (NUE) at farm level according to the different feeding systems used on dairy farms in Galicia.

MATERIAL AND METHODS



Fourteen dairy farms representing Galician feeding systems were selected:

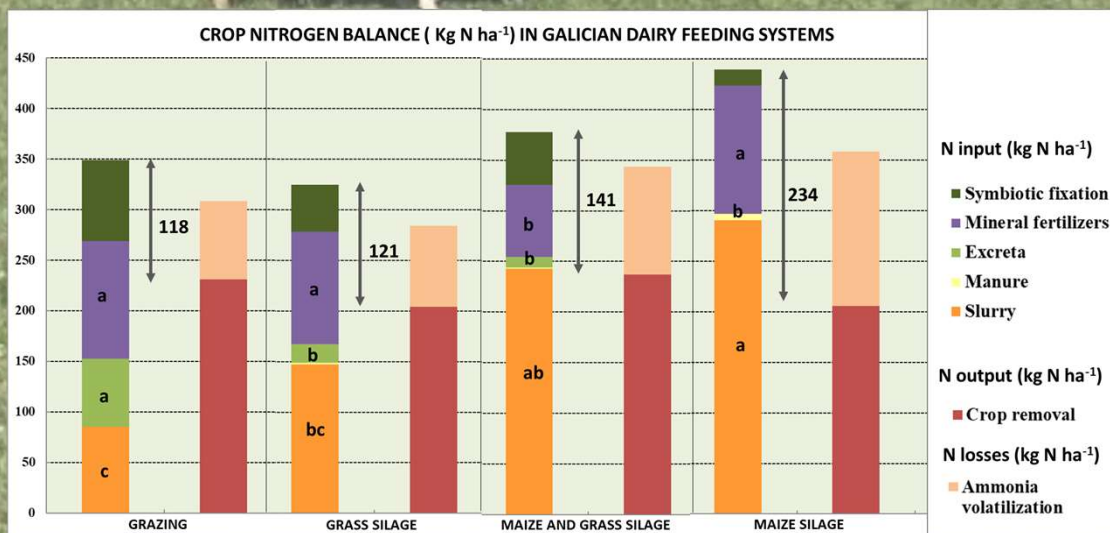
- Grazing (G, n=3)
- Grass silage (GS, n=3)
- Maize and grass silage (MGS, n=4)
- Maize silage (MS, n=4)

The nutrient balance was calculated per hectare of each forage crop and farm crop N balance was established for an average hectare according to the area occupied by each crop.

NUE was defined as N output in relation to N input.

RESULTS AND DISCUSSION

	G	GS	MGS	MS	SG
N° cows	56	62	83	210	NS
Agricultural area (ha)	40.3	49.46	50	96.5	NS
Livestock unit ha ⁻¹	1.7 bc	1.6 c	2.2 b	2.8 a	***
L cow ⁻¹ year ⁻¹	5985 c	8307 b	10309 a	10985 a	**
Concentrates (kg cow ⁻¹ year ⁻¹)	1599 b	2860 ab	3020 ab	3964 a	*
Crop N balance (kg N ha ⁻¹)	118±43	121±17	141±117	234±117	NS
Crop NUE (%)	67±7	63±2	67±24	49±12	NS



CONCLUSIONS

Crop N balance and crop NUE did not differ among the different feeding systems used on dairy farms in Galicia, nevertheless more N input was supplied by slurry as the systems intensified.

The huge individual variability among and within the feeding systems indicates a large margin for improvement on many of the dairy farms.

Improvement of N balance and NUE requires better N use, by applying slurry (main N input) using methods that reduce volatilization of ammonia and when required by the crop, which would significantly reduce the need for mineral fertilizers.