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Nitrogen flows in dairy cows fed various proportions of low-N fresh grass and maize silage

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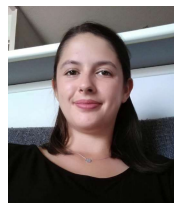
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HAL Authorization



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Dairy farm sustainability = \searrow environmental impacts and N losses



Fresh grass = Low-cost on-farm feed of good quality, providing environmental services
But great variability of composition and availability throughout the year



Fresh grass + Maize silage \rightarrow **Effects on cow N utilisation ???**

Frequently associated with conserved forages

What are the effects of increasing maize silage proportion in a fresh grass diet on cow N excretion and efficiency ?

4 diets :



0 %	100 %
17 %	83 %
34 %	66 %
51 %	49 % (DM basis)

7 lactating Holstein cows, Latin square **4 diets** \times 3 periods of 3 weeks

Ad libitum feeding (ray-grass + maize silage) **without concentrate**

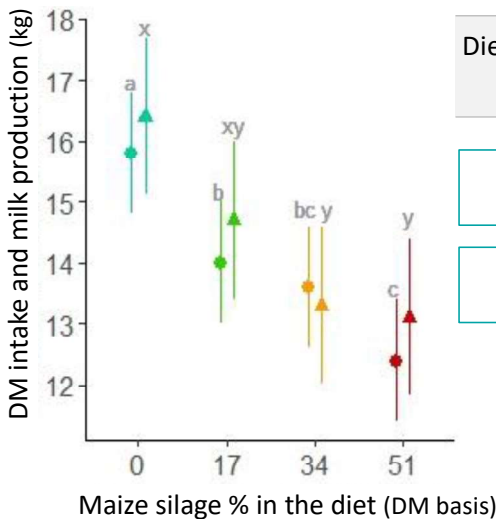
Individual measurements : Intake, milk, faeces, urine amounts (kg) and N concentration (g/kg)



Very low grass crude protein (CP) concentration

Maize silage % in the diet (DM basis)

	0	17	34	51
Diet CP concentration (g/kg DM)	107 ^a	99 ^b	92 ^c	86 ^c
	Low	\longrightarrow		Very low



Milk protein concentration and N milk \searrow for diet including maize silage (-1.9 g/kg and -20 g/day) compared to diet without maize

N efficiency \nearrow for diet with 51 % of maize silage (40 %) compared to the 3 others (34%)

+10 % maize silage in diet =



N intake
- 20 g N/day

N urine
- 5.0 g N/day

N faeces
- 5.5 g N/day

\nearrow maize silage in the diet \searrow DM intake (●) and milk production (▲)

a, b, c = P value intake < 0,05 ; x, y = P value milk < 0,05

Increasing the % of maize in unusually low-N grass diets induced very N-deficient diets on which N efficiency was increased and losses to the environment were minimal

