



# Substitution rate between forage supplement and grazed pasture in dairy cows : a meta-analysis

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**Grazing is amazing:**

- High-quality forage (E and N)
- Lowest cost of production

but

- periods of pasture shortage (summer, autumn)
- limited grazing area with large herds

☛ **very frequent « mixed diets »: grazing/conserved forage**

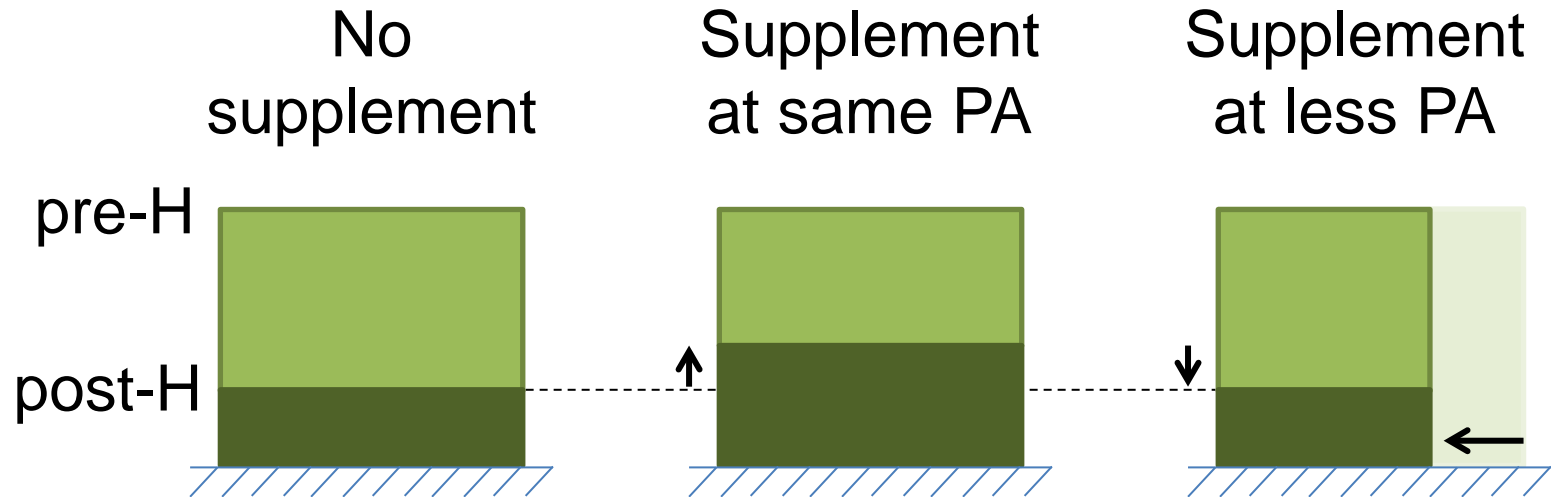
## **Nutritional effects of a forage supplementation ?**

*Forage intake ⇔ less pasture intake ⇔ more milk ?*

*Literature for Forage <<<< for Concentrate*



# Two ways for managing grazing when cows are supplemented



Pasture  
utilisation  
/ha

High

Low

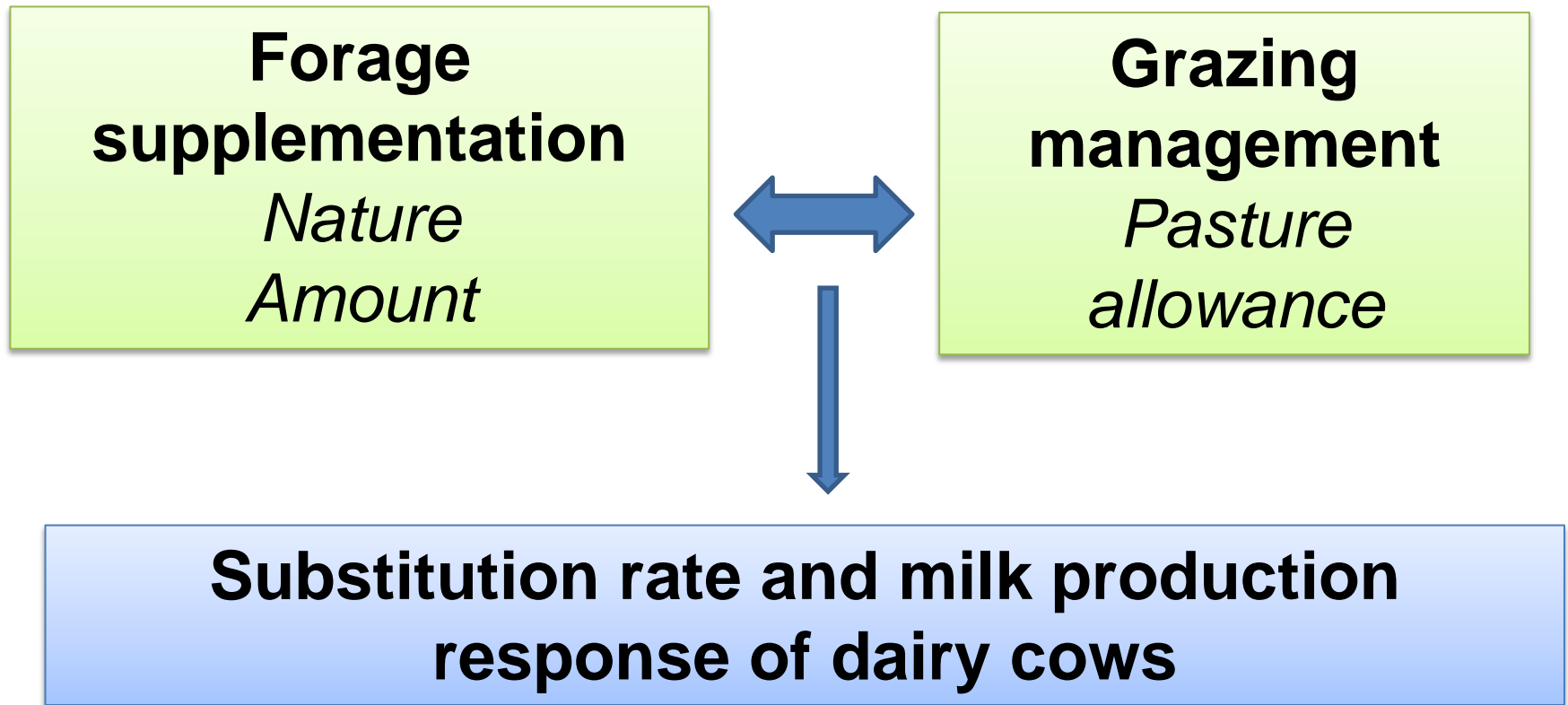
High

Approach:

« scientific »

« practical »

# Objective of the meta-analysis



- **Only within-experiment animal responses**  
*(without FO) vs. (with FO) treatments*
- **Required data:** pasture intake, milk, herbage allowance  
*Filtering: Temperate regions*  
*No concentrate variation*  
*No restriction of daily access time*
- **Database split in two parts:**
  - D1: Same PA** between Control and Exp: « scientific »
  - D2: Less PA** in Exp than in Control: « practical »

# Results – D1: Same PA

+ 4.6 kg DM forage, Low PA : 25 kg DM/d

Supplement type	<b>Total</b> n=62	Maize silage n=34	Pasture silage n=12	Hay n=16
Substitution rate kg DM /kg DM	<b>0.40</b> <i>± 0.29</i>	0.36	0.31	<b>0.51</b>
Milk yield response kg milk /kg DM	<b>0.39</b> <i>± 0.31</i>	<b>0.53</b>	0.30	0.22

# Results – D1: Same PA

↗ substitution rate with ↗ PA (+ 0.17 per 10 kg of PA)  
*From 0.2 to 1.0 from Low to High PA*

◊ : Maize silage  
: Pasture silage  
◆ : Hay



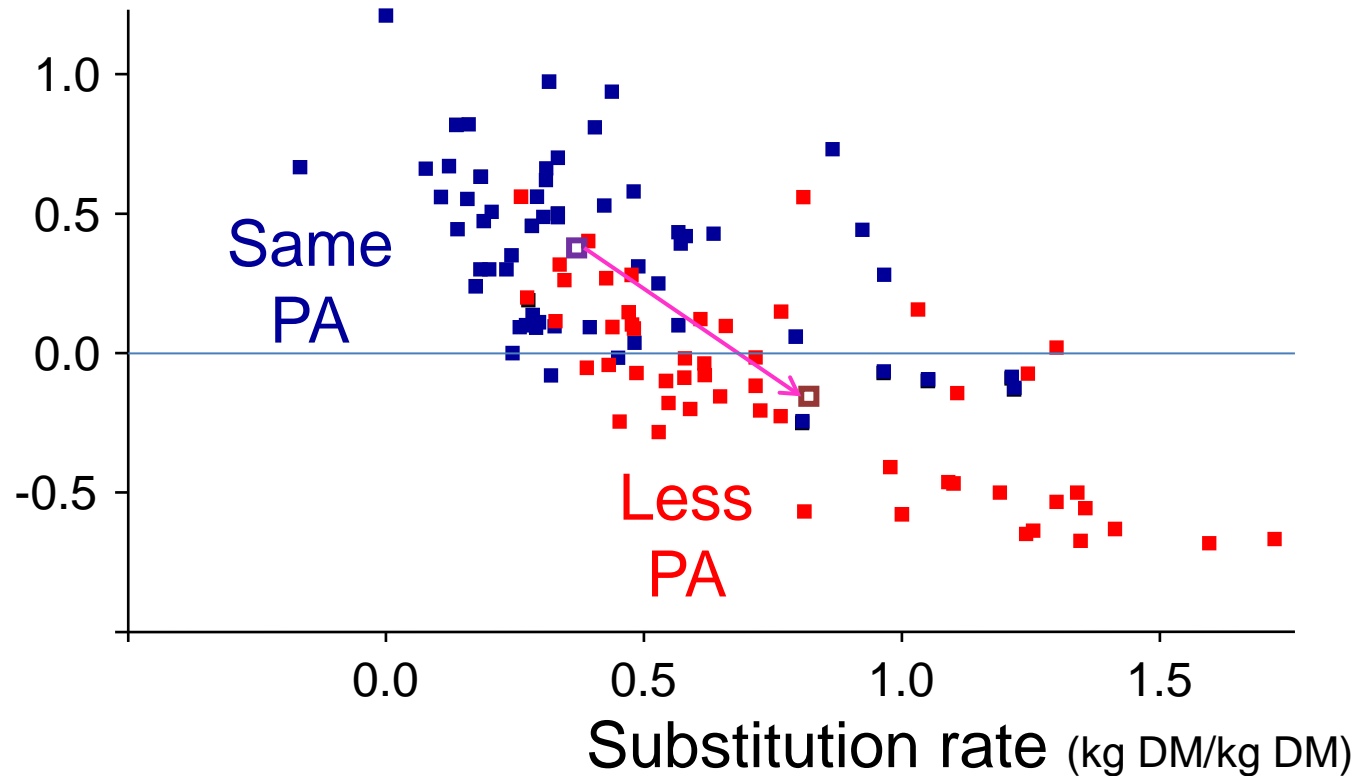
# Results – D2: Less PA

+ 7.3 kg DM forage, - 19 kg/d PA, -2.7 kg PA/kg forage

Database	D2 Less PA <i>n</i> =52	D1 Same PA <i>n</i> =62
Substitution rate (kg DM /kg DM)	0.79 ± 0.38	0.40 ± 0.29
Milk yield response (kg milk /kg DM)	-0.13 ± 0.33	0.39 ± 0.31

*Less PA: ↗ substitution rate, resulting from the cumulative effects of supplementation AND of less PA*

Milk yield response (kg milk/kg DM)



*Less PA: overall translation to more substitution and less milk response*

# Conclusions

- Large variations of substitution pasture/forage (from 0 to 1) largely explained by PA
- At same PA, positive milk response to forage supplement
- But **in practice, no milk response to forage supplement**  
*High pasture utilisation =  $\searrow$  PA =  $\nearrow$  substitution*

## Practical implication

- No interest to supplement cows with a conserved forage if no pasture deficit at farm level

**Maximise the use of grazing on dairy farms !!!**

# Thank you for your attention

