Does the increase of feeding frequency with automatic system impact the behaviour of dairy cows ?

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“Feeding robot in 2012”

- **Commercial pressure : 12 manufacturers**
- **High level of investment : ≈ 25 à 35 €/1000 l, (without silos)**
- **Decreased working times but concern about return**
- **Zootechnical performance**
  - Possible adaptation of diets
  - Less refusal and cleaning of feeding bunk
  - Increased meal frequency ?
    - 18 european herds : mean = 7,1 (3 -13) (Nydegger et Grothmann, 2009)
    - 10 french herds : mean = 6,9 (3 -10) (Institut de l’Elevage, 2013)
- **… Consequences on ingestion, dairy production and behavior of animals ?**

Objective

- To measure the impact of meal frequency on zootechnical performance and behaviour of cow

- Preliminary trials after first installation in experimental facilities

Experimental facilities at « La Jaillère »

- **Experimental farm : La Jaillière, ARVALIS**
  - Cubicle and rotative milking system
  - Feed bunk with headlock barrier
- **Feeding system (Rovibec, Canada)**
  - Management of forage
  - Management of concentrate
  - Mixing
  - Distribution
- **Some pictures …**

Forages

- **Silages**
  - Horizontal silos with walls
  - Transfer of the silages towards 3 reserves (1 day)
- **Round ball**

Concentrates

- Individual compartments for concentrate and supplementation
- Automatic transfer to the mixing system

Total Mixed Ration

- 32 diets possible

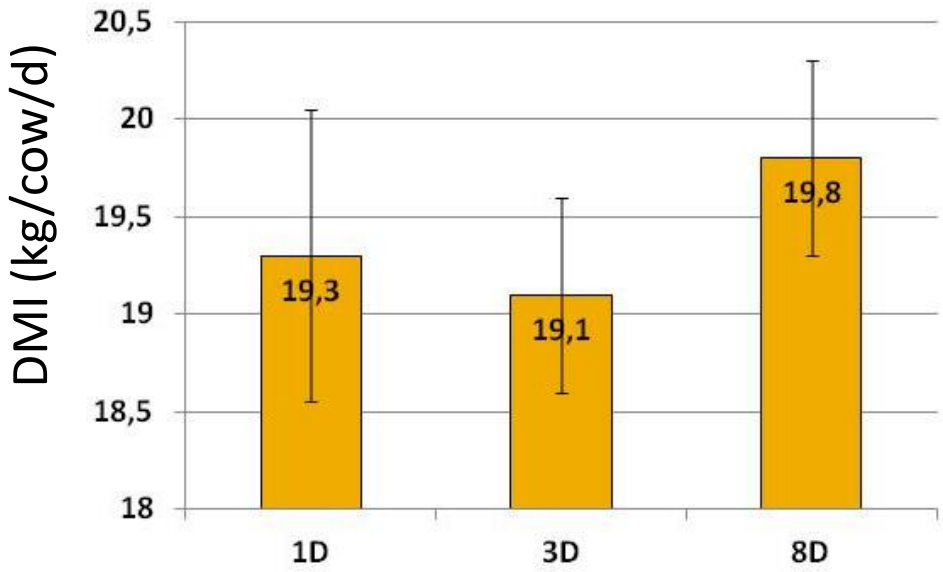
Feeding robot

- Conveyor suspended with rail and cart (500 kg maxi = 5 min.)

Material and methods

- **From January to March 2013**
- **3 groups of 17 cows (9 primi.) after lactation peak**
- **3 feeding strategies**
  - 1D : 1 meal/day (7:30) + 2 human interventions
  - 3D : 3 meals/day (7:00, 12:45, 18:20)
  - 8D : 8 meals/day (every 2 hours between 4:00 and 18:00)
- **TMR :** Maize silage and grass silage with 38 % concentrate (+ min. and vit.) , DM = 44%, ad libitum
- **Measures**
  - Zootechnical performances
  - Behaviour 1D and 8D :
    - Time-budget by scan sampling (15mn) during daylight period (10:00 to 16:00)
    - Agonistic behaviour by ad libitum observations after distribution at 8:00 and 16:15

Feed intake



No effect of the number of meals

(Refusal between 7 and 9 %)

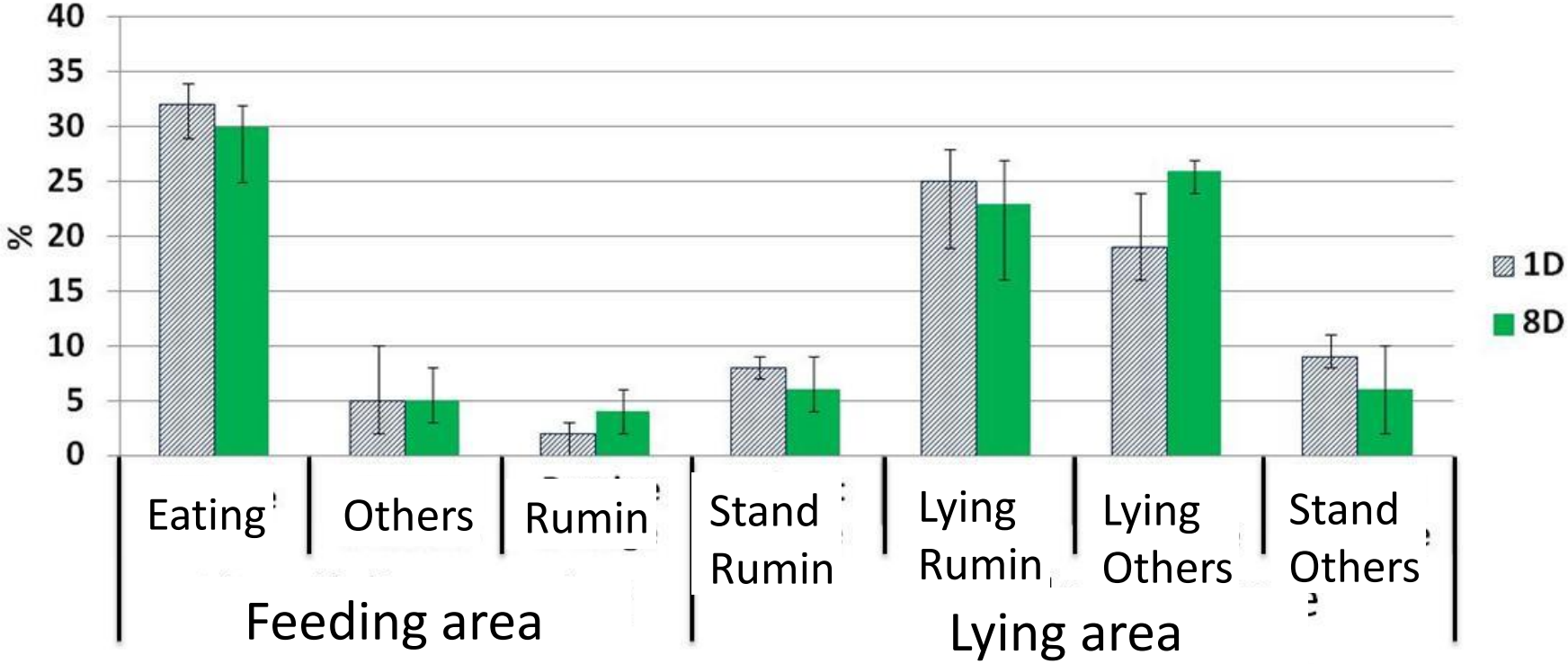
Zootechnical traits

Treatments	1D	3D	8D	*ETR*	*Sign.*
Milk production (kg/d)	24,4	23,6	24,1	*2,4*	*NS (1)*
Fat content (g/kg)	42,7	43,0	41,6	*4,0*	*NS*
Protein content (g/kg)	31,2	31,4	31,1	*2,0*	*NS*
Milk 4 % of fat (kg/d)	25,4	24,7	24,7	*2,9*	*NS*
Fat (g/j)	1 042	1 015	1 003	*140*	*NS*
Protein (g/j)	761	741	750	*74*	*NS*
Variation of weight (g/d)	+ 54	+ 222	+ 268	*428*	*NS*

- **Low feeding efficiency (50 % primiparous and after lactation peak)**
- **No major effect, in accordance with bibliography**

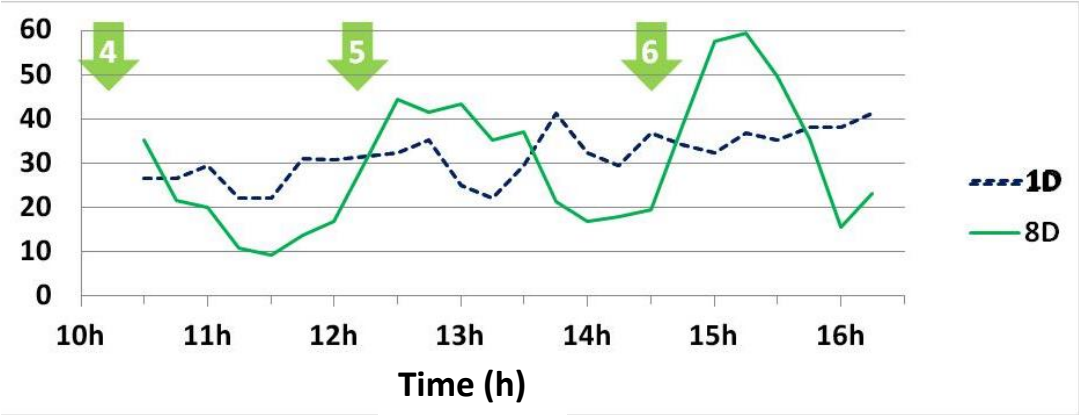
Time-budget …

- Few agonistic behaviour
- Similar time-budget

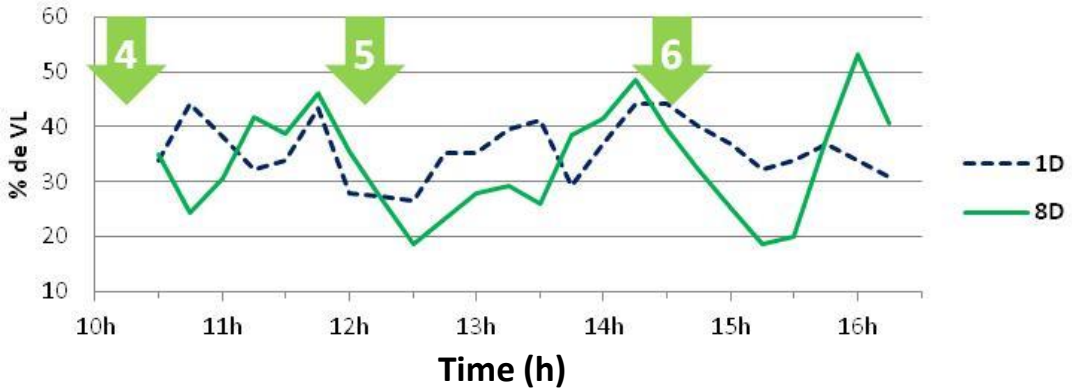


And behaviour course

- Cows at the feed bunk



- Cows ruminating



- Synchronised activities of « 8D » group with meal distribution
- Practical consequences : size of feeding area

Limits and perspectives

- **Reduced duration of observation**
  - One group of cows per treatment
  - Diurnal observation
  - Etc
- **No competition in our conditions**

- **Taken into account these limits, in our conditions**
  - No major diurnal time-budget effect
  - No major effect on zootechnical performance
- **… but to be checked on a larger scale in commercial farm**

Thank you for your attention and « Bon appétit »