Are physical and feeding activities at pasture impacted by cattle breed and previous feeding restriction?

A. De La Torre[1], F. Anglard[1], M. Barbet[2], A. Le Morvan[1], J. Agabriel[1], R. Baumont[1]

[1] INRA, UMR Herbivores, 63122 Saint Genès Champanelle

[2] INRA, UE Herbipôle, 63820 Laqueuille

INRA SCIENCE & IMPACT

UMT SAFE

VetAgro Sup

Feeding behaviour : why is it important?

- Eating and rumination behaviour provide useful information regarding the **cows' health** (Cook et al, 2005; Viazzi et al, 2013)

- **Improve understanding of the sward-animal relationships** (Delagarde & Lamberton, 2015)
  - Coupled with measurements of DM intake, usefull to estimate pasture intake rate

- Feeding behaviour and locomotion activities associated with animal performances : a contribution to characterize animal adaptive responses subjected to disturbances
  - A way to apprehend the **robustness of cows in changing environment**

Recording feeding behaviour

- Observations of feeding behaviours are **time consuming** and **difficult** especially in large herds
- Use of **automated devices** : **facilitates the monitoring** of individual's behaviour

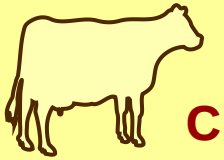
Aims of the study

- **Preliminary work** to record physical and feeding activities of beef cows during the grazing period with automated systems (Rumiwatch®, Ethosys®)
- To evaluate the **impact of a previous feeding restriction and of cattle breed** on physical and daily grazing behaviours

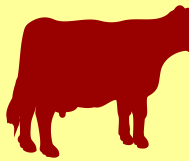
Experimental design

Feeding restriction period (110 days)

2 Breeds



CHAROLAISE



SALERS

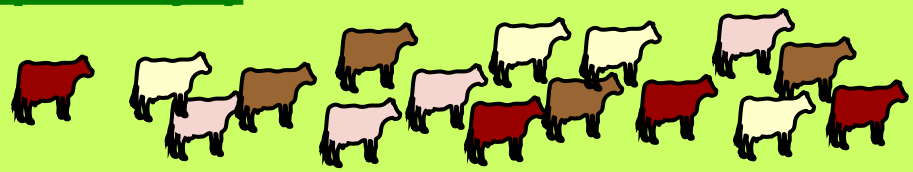
2 energy levels

	Control	Low	Control	Low
	CC (n=4)	**CL (n=4)**	**SC (n=4)**	**SL (n=4)**
Hay/Conc	85 MJ/d	45 MJ/d	85 MJ/d	45 MJ/d

Net energy of lactation

Grazing period (70 days)

Rotational grazing system



Recording of physical and feeding activities over 1 week

- **Period 1 : just after the turn-out**
- **Period 2 : 8 weeks after the turn-out**

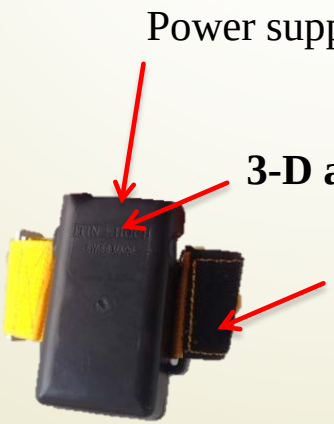
Recording devices :

1- Rumiwatch® system (Itin+Hoch, Swissbit AG, Switzerland) including

Noseband-sensor

RWU manager2: V2.0.6.0 firmware version
Data converter : V0.7.3.2

Pedometer

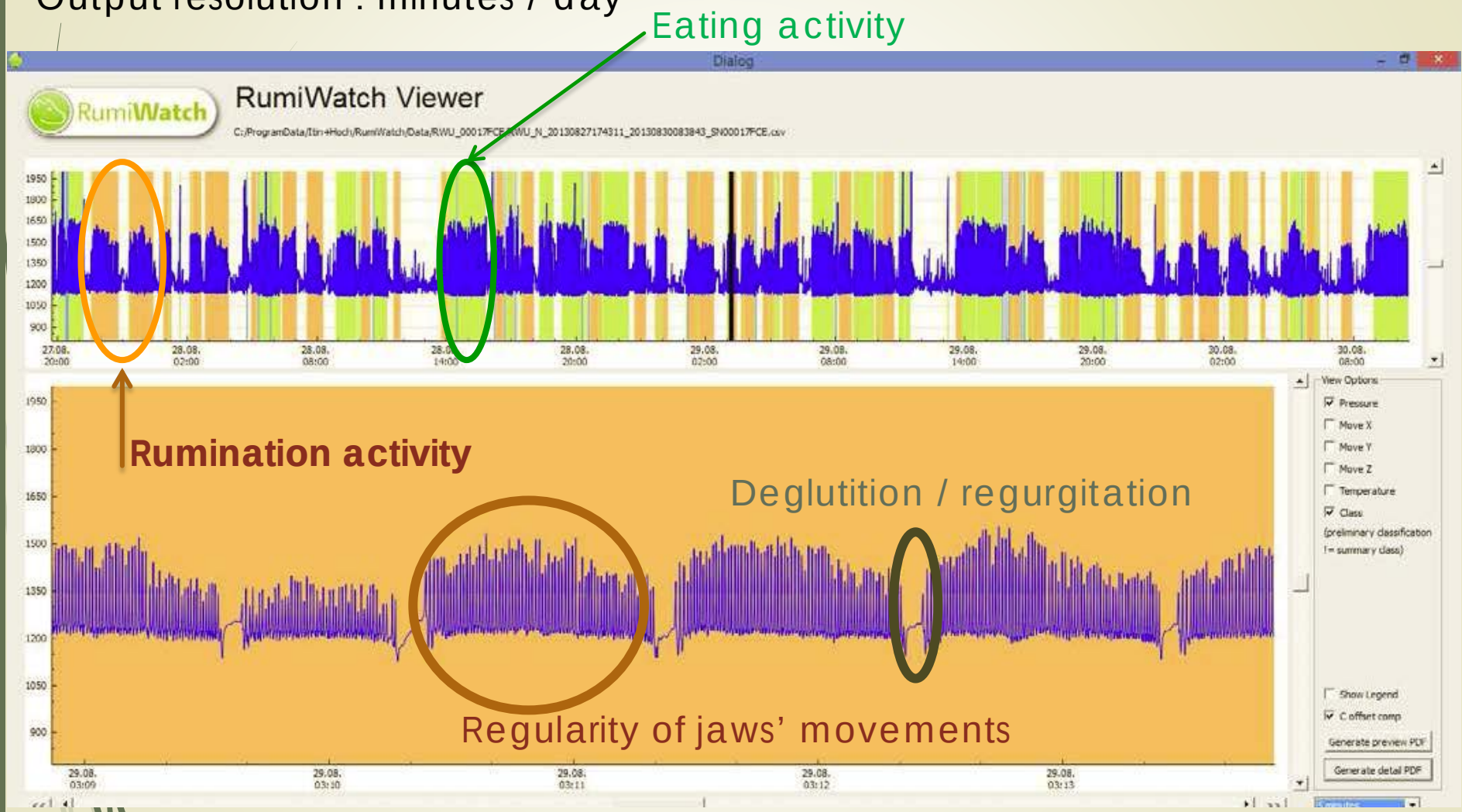


Total weight: 126 g

1- Rumiwatch® system (RWS)

Continuous recording of eating and rumination time over 6 days within period

Output resolution : minutes / day

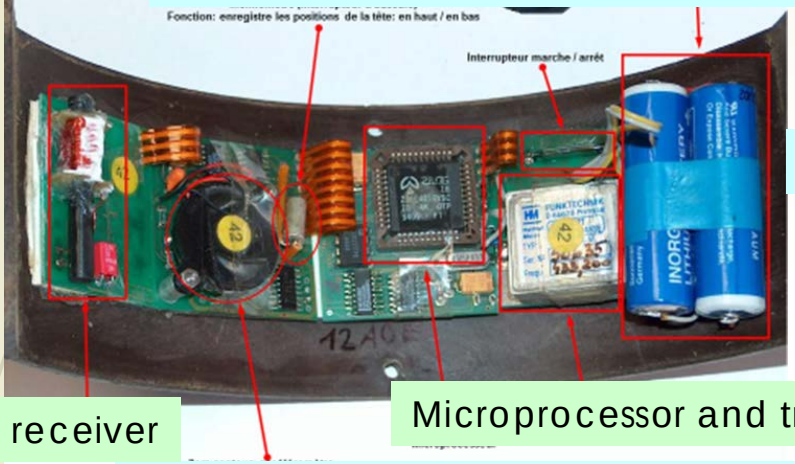


2- Ethosys®

Recording of the position and the movements of head, time scale: 5 min

Devices validated in grazing dairy cows *(Perez-Prieto et al., 2012)*

Position sensor (records the position of the head : up or down)



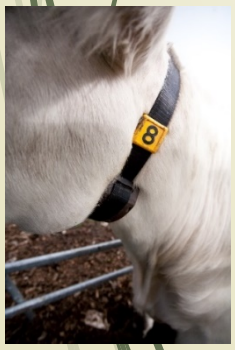
Power supply

Radio receiver

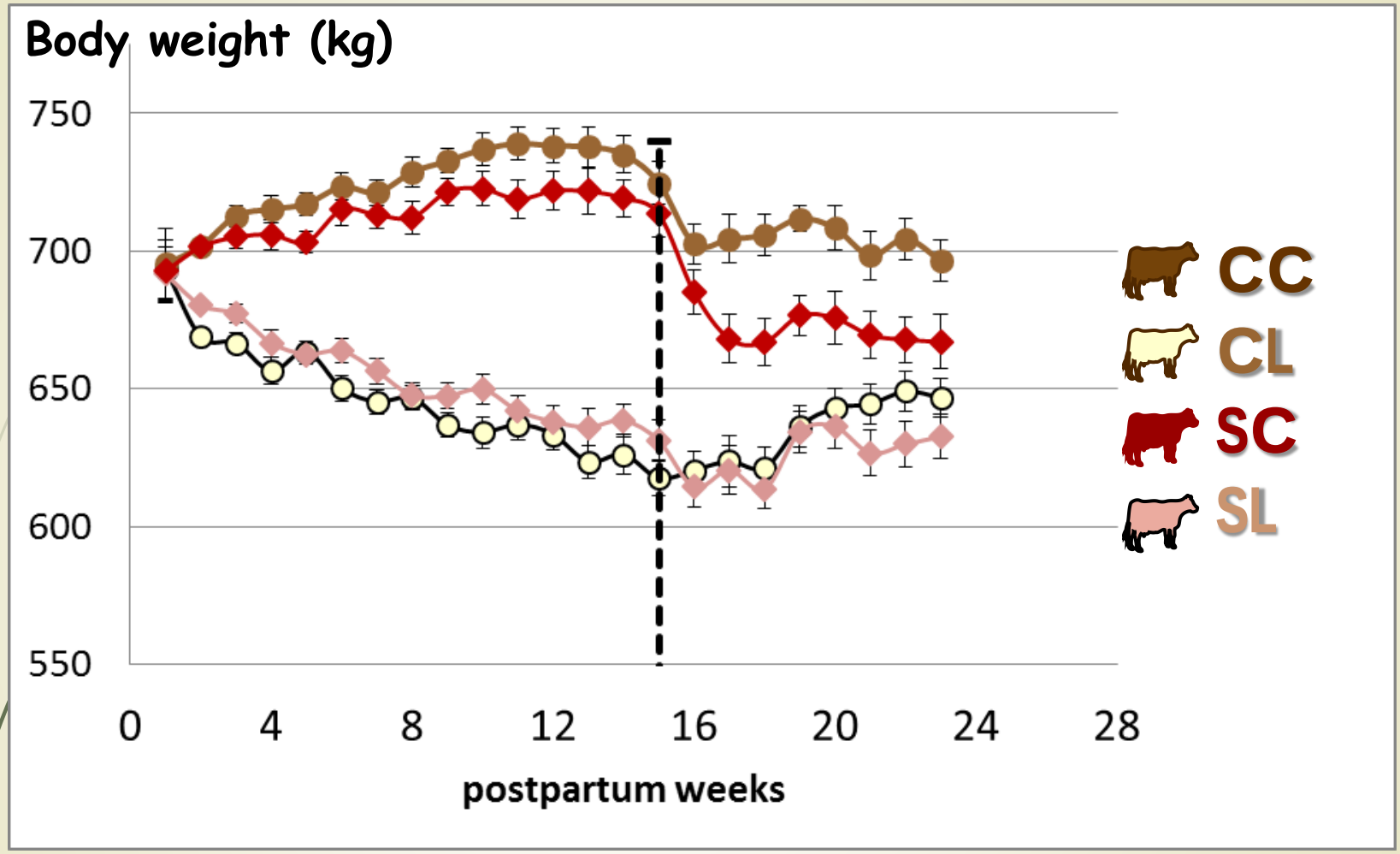
Microprocessor and transmitter

Acceleration sensor (records the movements of the head)

Hypothesis : head movements in a **down position** (<2.5 min/5) ↔ **eating activity**
head movements in a **up position** (>4 min/5) ↔ **rumination activity**



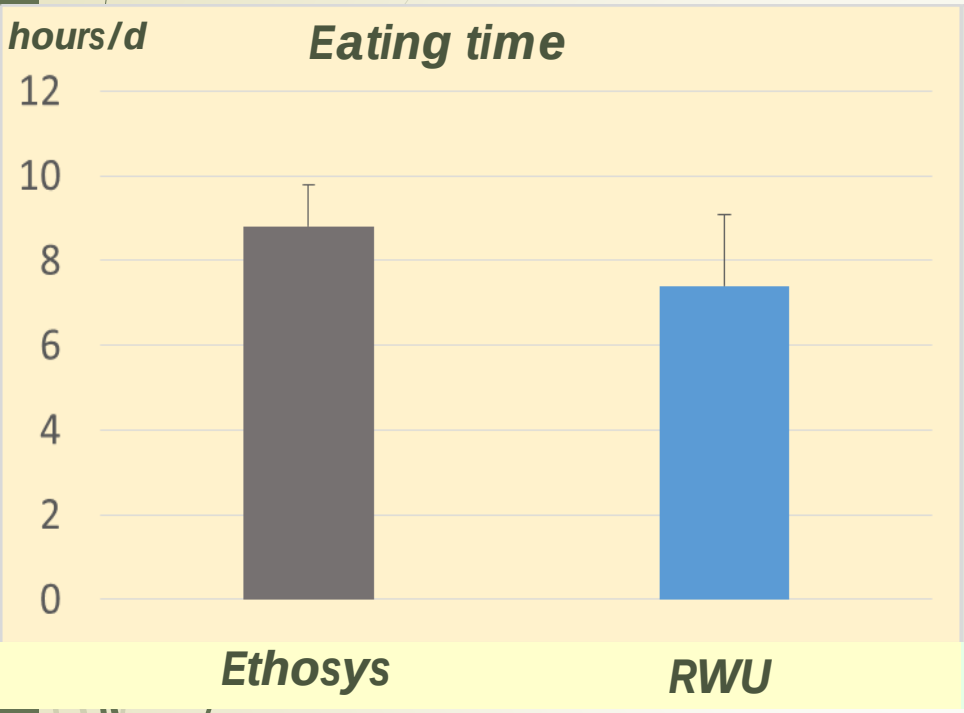
Performances of cows over the experimental design

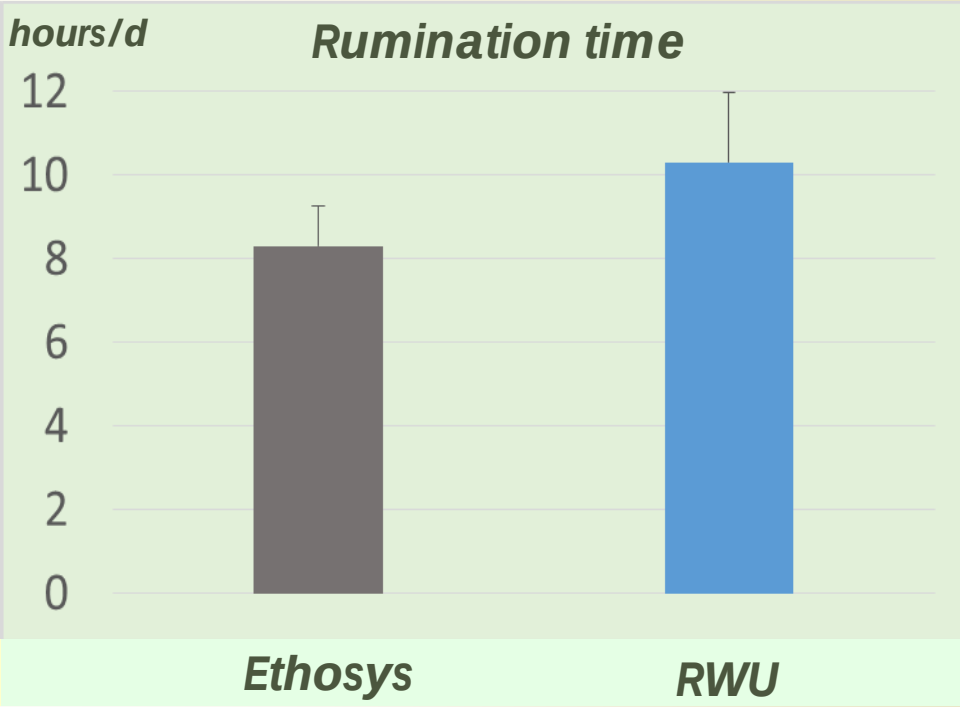


The **feed restriction** resulted in a **weight loss** ≈ 530 g/day

The grazing period corresponded to a weight gain in restricted cows (230 to 700 g/day) and no changes in control cows

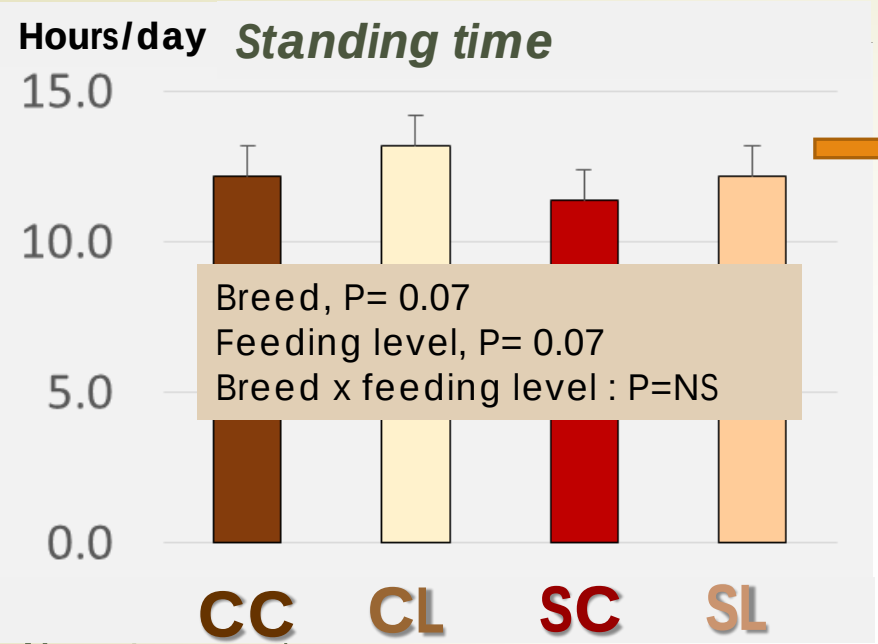
Comparison of daily time budget : Ethosys® *vs.* Rumiwatch®

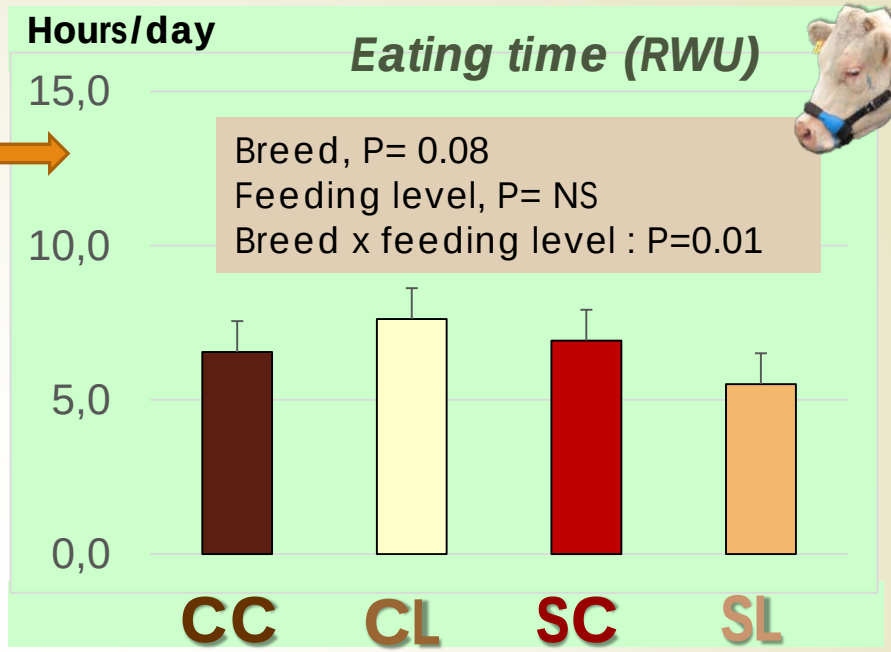


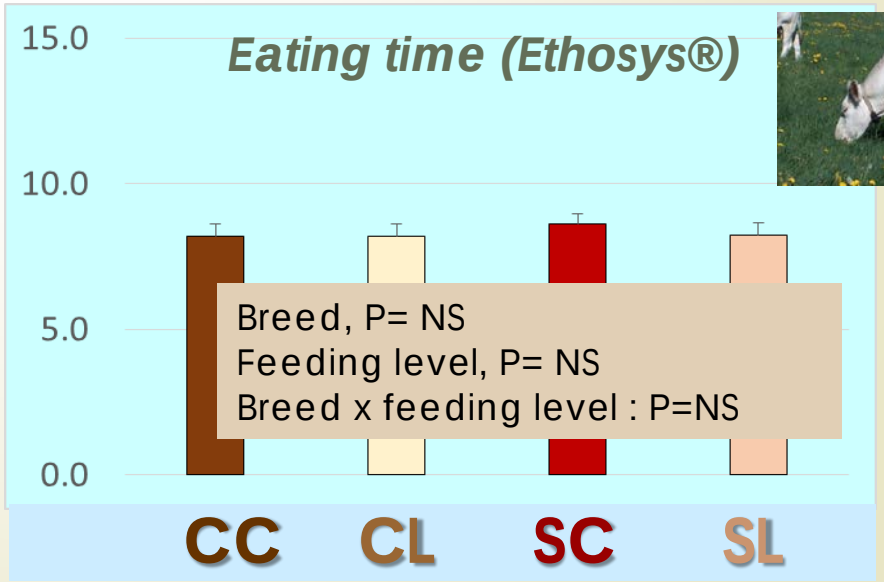


Due to a high variability in the results, **no significant differences** between the two automated devices were noticed

Budget time of period 1: just after turn-out (1)



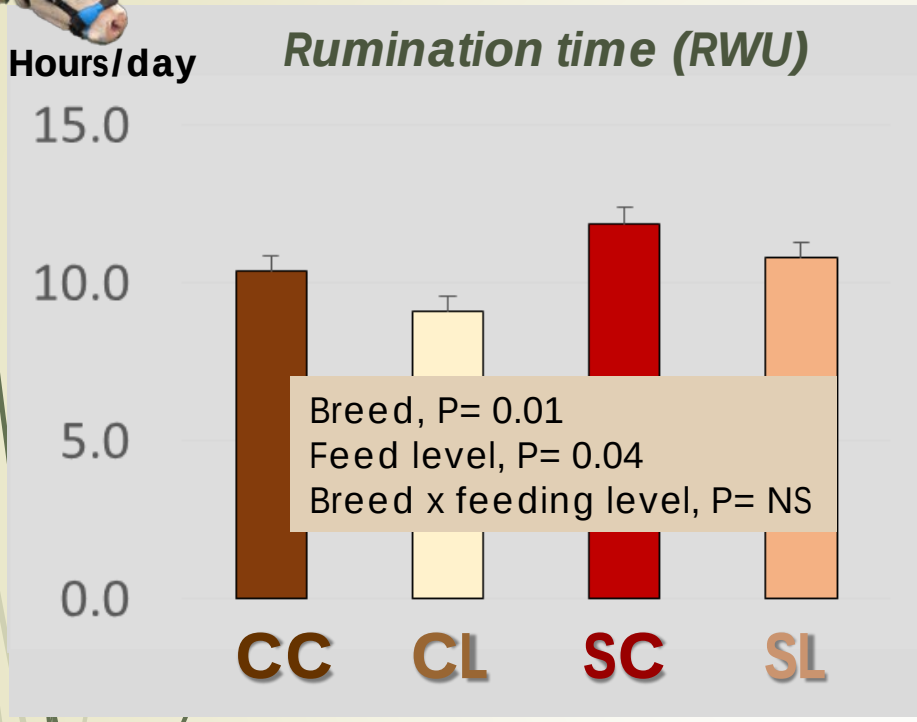


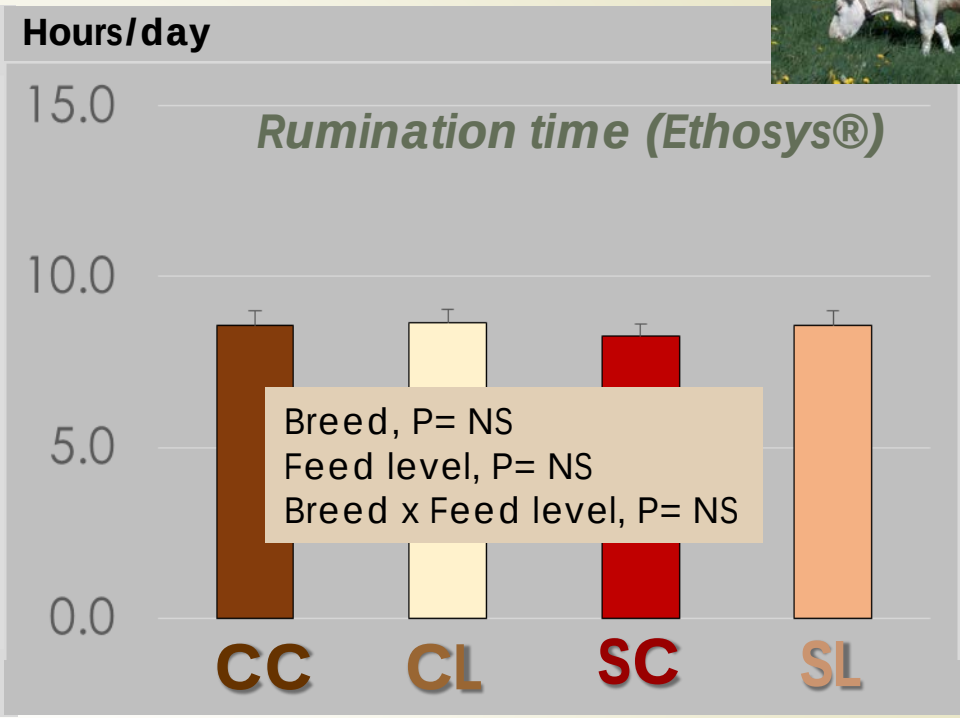


Feed restricted cows tended to spend more time in a standing position

No effect of the previous feed level on feeding activities whatever the breed

Budget time of period 1: just after turn-out (2)

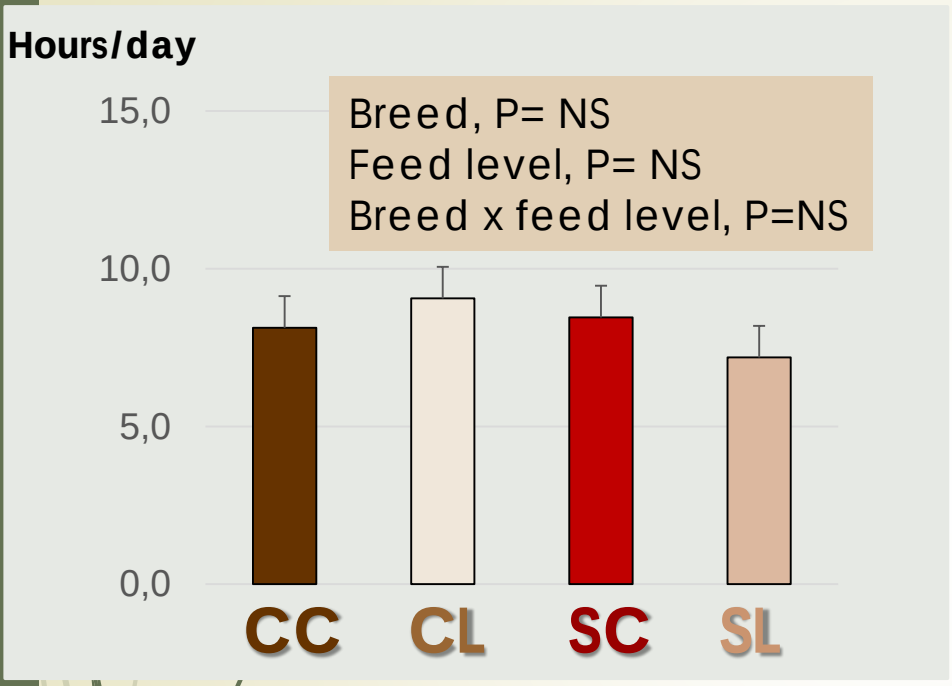




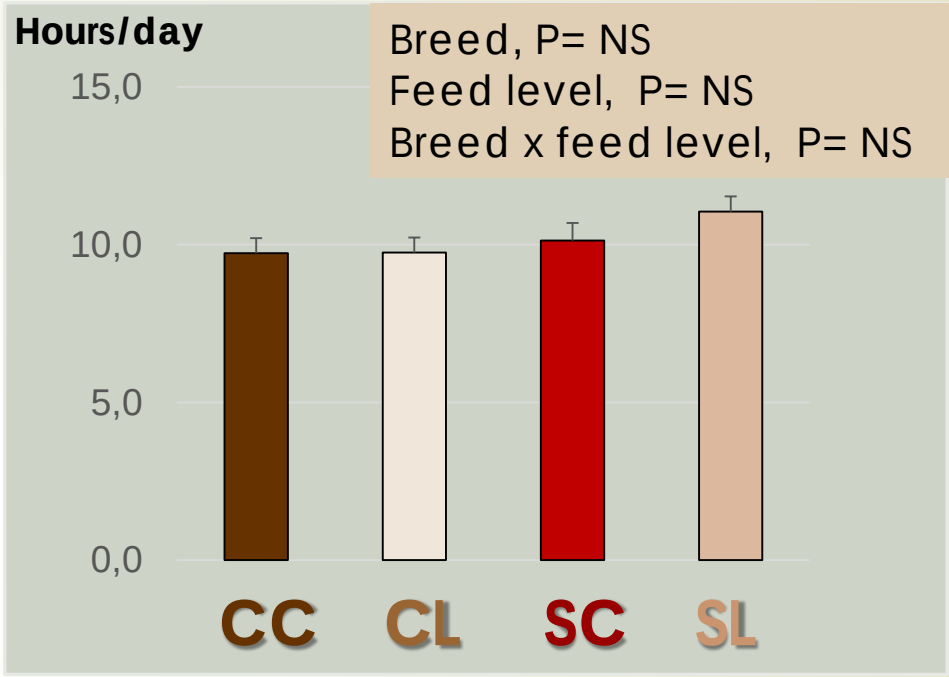
The effect of feed level and breed on the rumination time observed by RWU was not confirmed by Ethosys®

Budget time of period 2: 8 weeks after turn-out

Eating time (RWU)



Rumination (RWU)



Similar results were obtained with Ethosys® devices

Differences which could exist just after turn out were no more observed 8 weeks later.

Conclusions

No significant differences in feeding and physical behaviours according to the breed and the previous feeding management whatever the automated devices used

Automated systems are usefull to apprehend behaviours of animals

→ Better understand animal responses
→ Better estimate daily pasture intake (with grazing time)

→ Improvement of algorithms are necessary to better apprehend changing environnements, types of animals and interaction between animals and their breeding conditions

Thank you for your attention

Marie Breucq

SAVE THE DATE

September 2-6, 2018
Clermont-Ferrand, France

Website: https://symposium.inra.fr/isnh2018
Contact: isnh2018@clermont.inra.fr