



Automated warning system based on feeding behaviour

Lessons learned in pigs. Also relevant for dairy?!

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Third DairyCare conference

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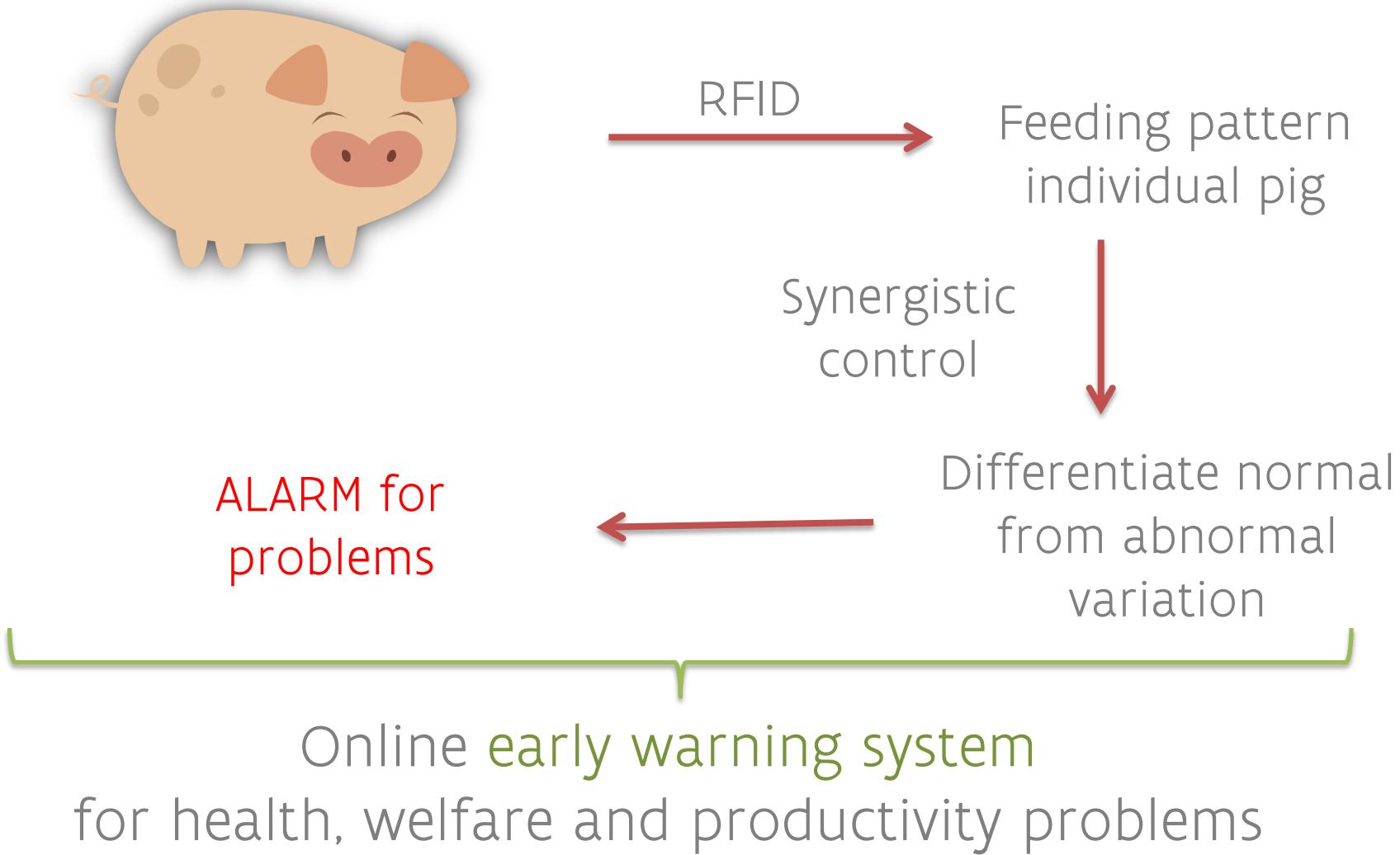


Outline

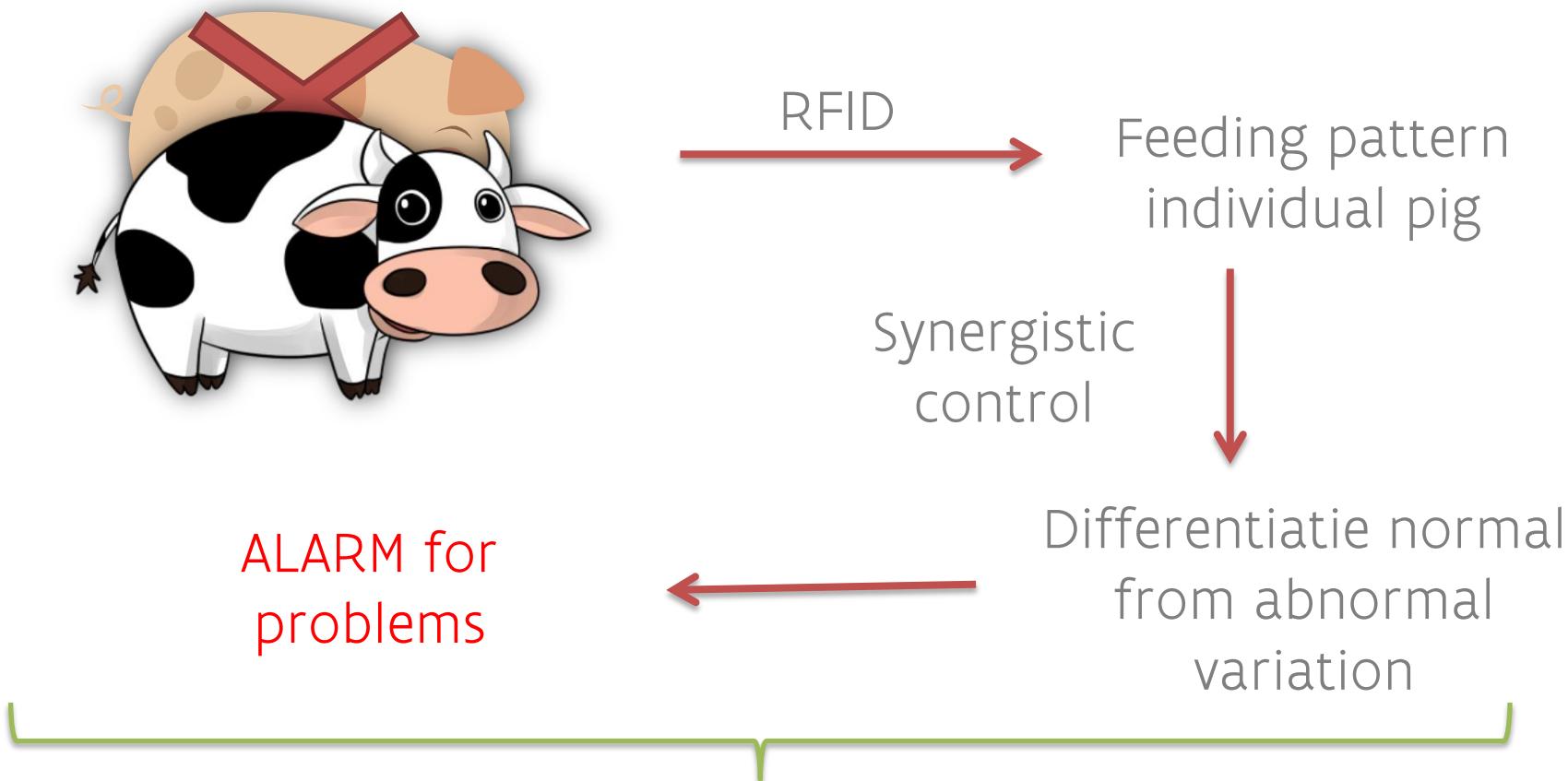
- A. What are we doing with pigs?
- B. Steps to take during research on animal feeding behaviour:
 1. What is (affecting) feeding?
 2. How to measure it?
 3. How to express it?
 4. What about meals?

Maselyne, J., Saeys, W., and Van Nuffel, A., 2015. Review: Quantifying animal feeding behaviour with a focus on pigs. Physiology & Behavior 138, 37-51.
+ erratum: Physiology & Behavior 142, 189.

Warning system for pigs



Warning system for ~~pigs~~ Cows?



Online early warning system
for health, welfare and productivity problems

European PigWise project 2011-2013



PhD 2011-2015

“Automated monitoring of individual fattening pigs”



Effects on feeding behaviour

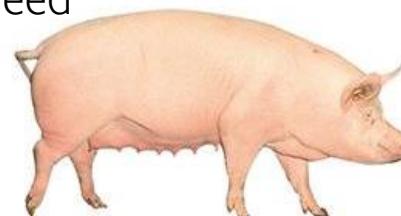
Feed



Feeding system



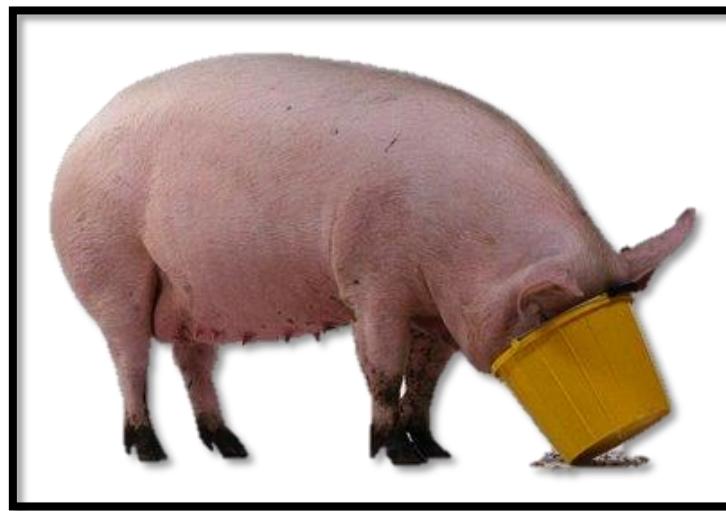
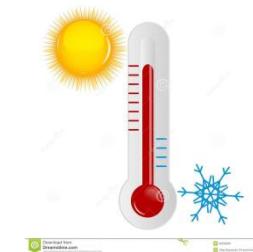
Breed



Health, weight...



Environment



...

Housing system



Effects on feeding behaviour

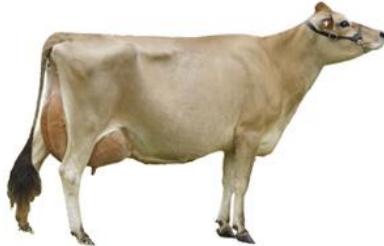
Feed



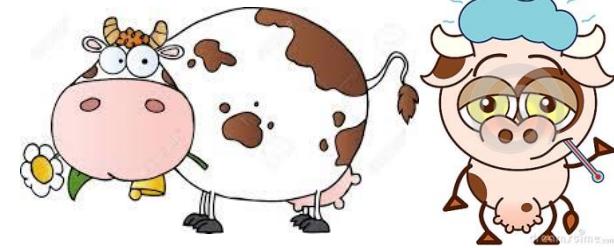
Feeding system



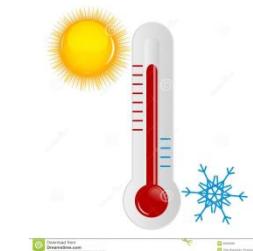
Breed



Health, weight...



Environment



Housing system



...



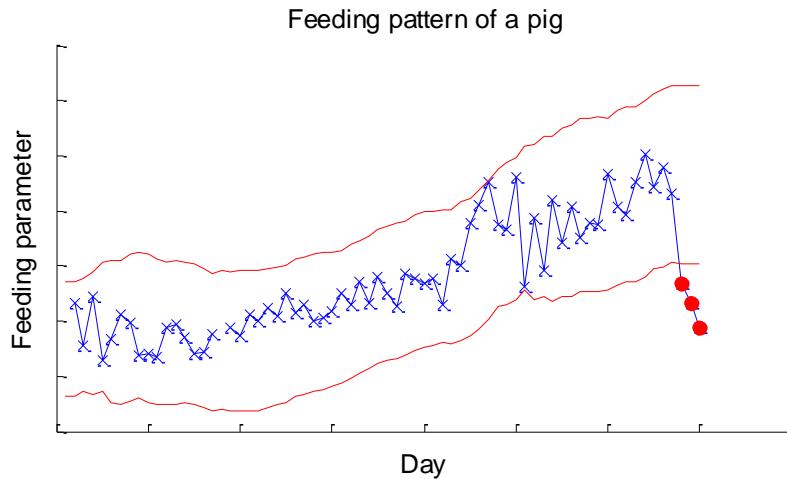
Feeding = flexible

Variety of influencing factors

+ differences between individuals

-> design experiments wisely...

-> large inter- and intra-individual variation



→ Monitor individual animals & take normal variation into account

Sensors to measure feeding behaviour

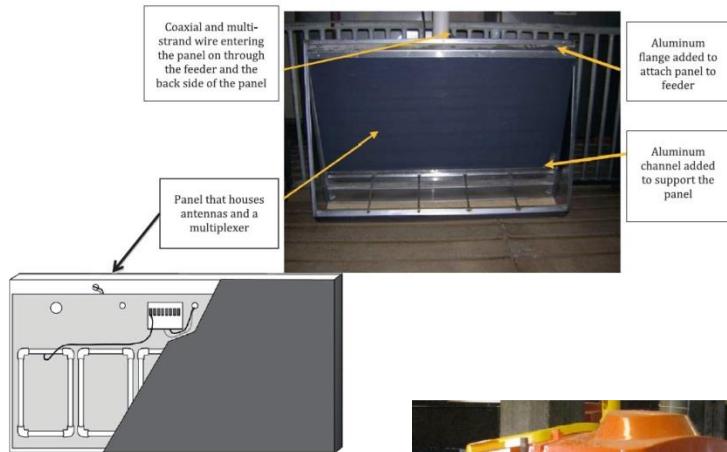
Especially designed feeders



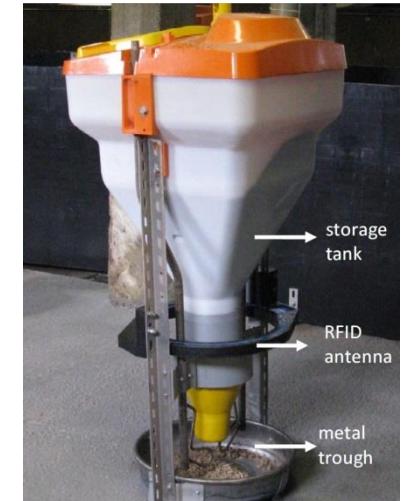
- €€€
- Feed intake recorded
- Different feeding behaviour?



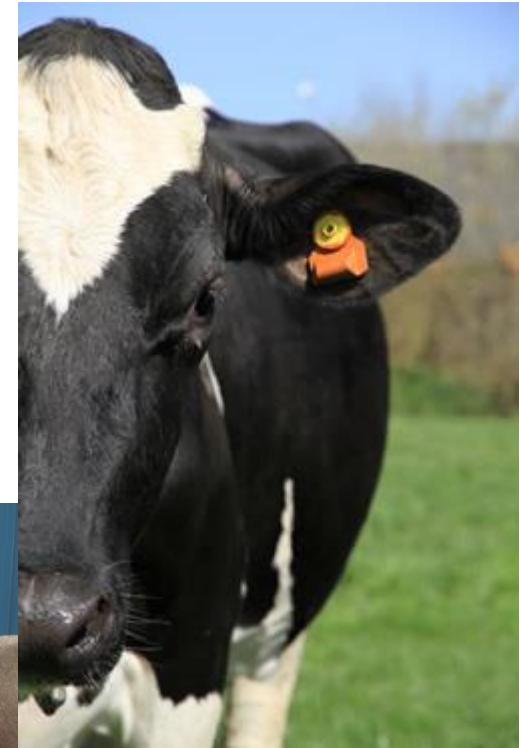
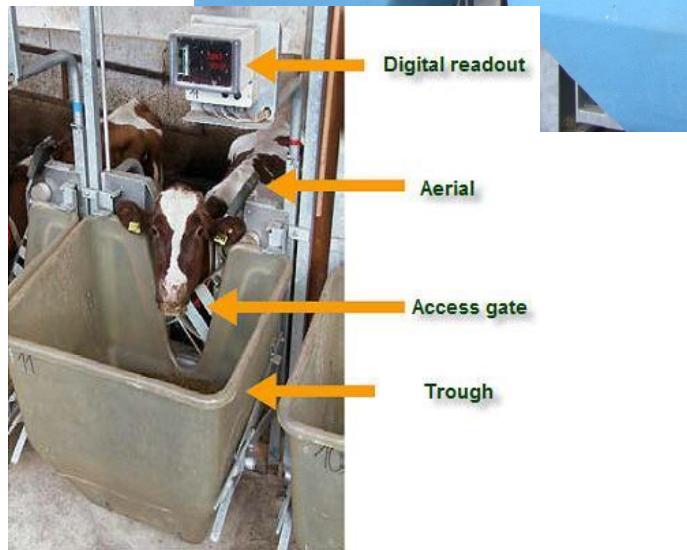
RFID added to commercial feeders



- €€
- No feed intake recorded
- Simulate farm conditions
- Adoption by farmers easier?



Sensors to measure feeding behaviour



Choice sensor?

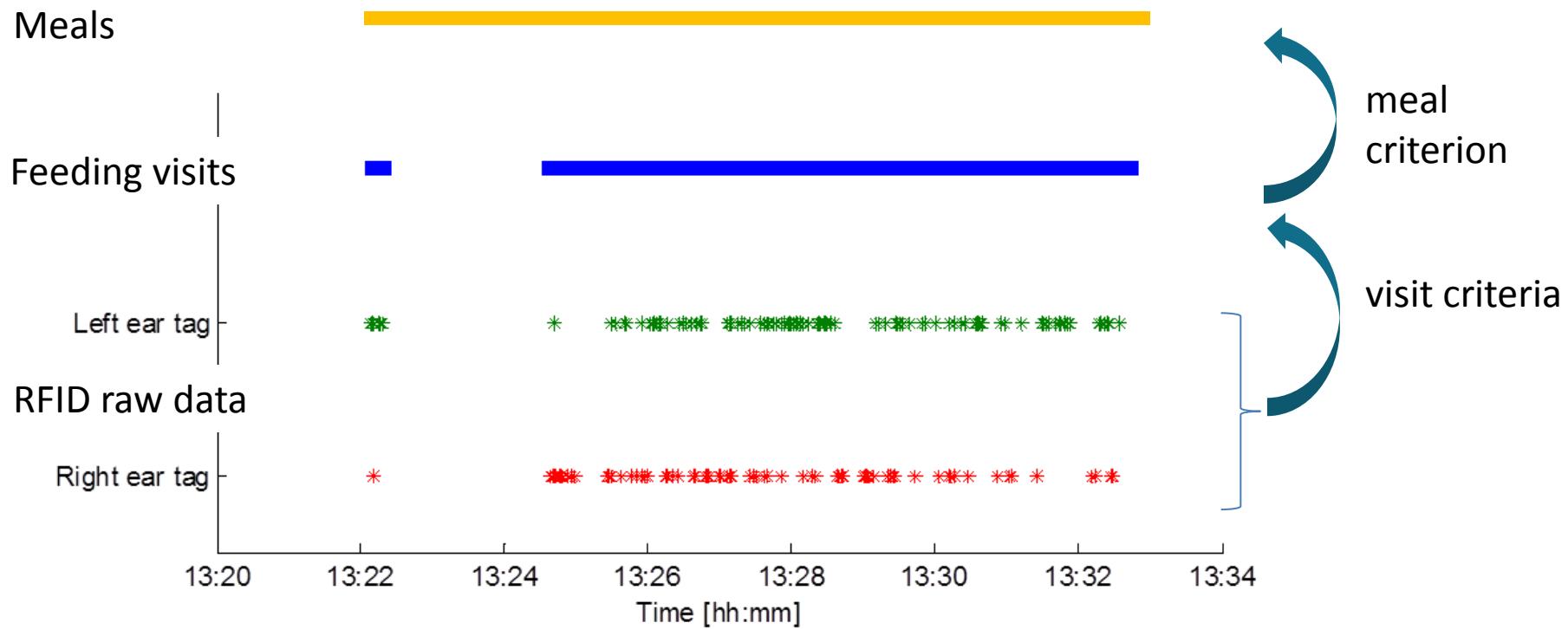
- No effect on feeding behaviour?
- What do you want to measure?
- On-farm conditions?
- Cost?
- Settings? Measurement frequency!
- Data-analysis necessary?

=> Choose correct sensor for your application &
validate properly

Units of feeding behaviour

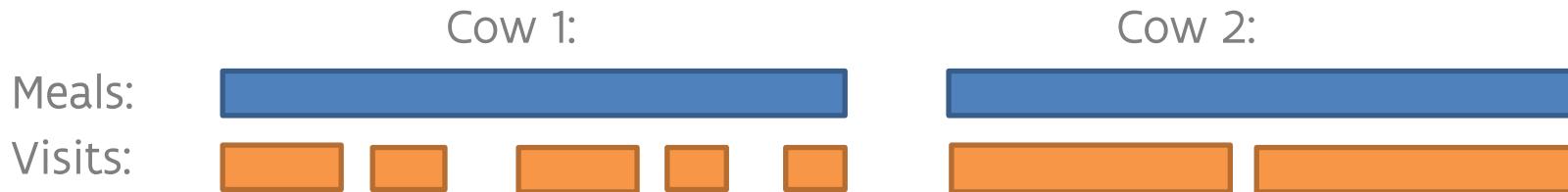
Registrations / feeding visits / meals / chews / ...

e.g. with the PigWise RFID sensor:



Choice unit?

- Importance?

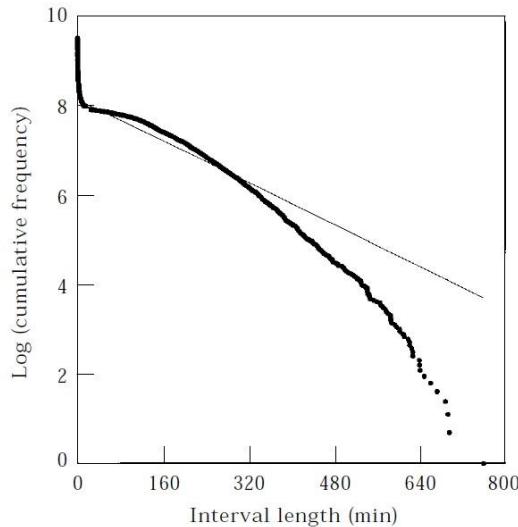


- Per unit also ≠ variables:

- Bout size, frequency, duration, interbout interval, rate of eating, ...
- Meals are best unit for analysis of short-term feeding behaviour (satiety, prandial correlations, treatments) (Tolkamp et al, 1999)

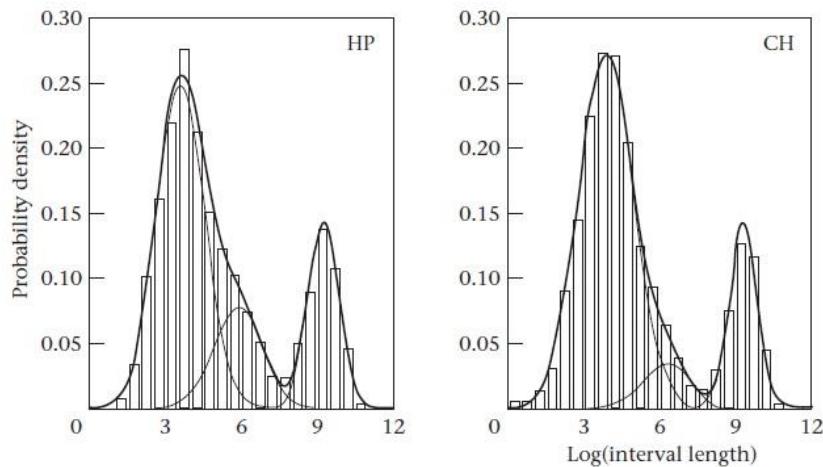
=> best choice for problem detection =
unknown!

Meal determination

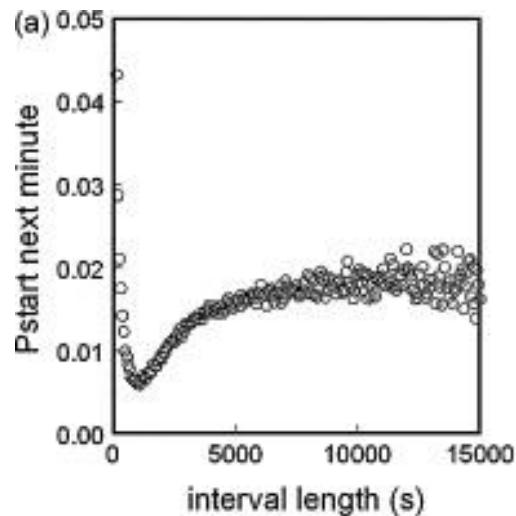


Log survivorship function

- Visual breakpoint
- Mixed distribution models
- Drinking-explicit method
- ...



Triple Gaussian models



Starting probability of feeding

Variety of methods

- Wide variety of techniques
 - feeding is random vs. satiety, prandial drinking vs. no prandial drinking, etc.
 - not all methods have correct assumptions or are objective!
- Link with real behaviour?

=> uniformity and validation of methods is necessary!

Conclusion

1. Understand feeding

- A lot of influences & large inter and intra-individual variation

2. Choose the correct sensor

- Take into account your application & validate!

3. Choose the correct unit

- Raw data: not yet manipulated / visits: true feeding duration / meals: most stable measure

4. Choose a method for meal determination

- Use method with correct assumptions

More info:

Maselyne, J., Saeys, W., and Van Nuffel, A., 2015. **Review: Quantifying animal feeding behaviour with a focus on pigs.** Physiology & Behavior 138, 37-51.

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Pig = dairy??

“Dutch farm becomes World’s first to sell cheese made of pig milk”
“First-ever pig’s milk cheese on sale at a staggering price”





Thank you!!!

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