



Assessing **time of ovulation** in dairy cows

Experiences from estrus detection validation studies

Ines Adriaens, Bart De Ketelaere, Wouter Saeys, Ben Aernouts

Why?

Estrus detection tools

- Sensitivity, specificity



Ovulation

- Prediction accuracy
- Link with heat attention



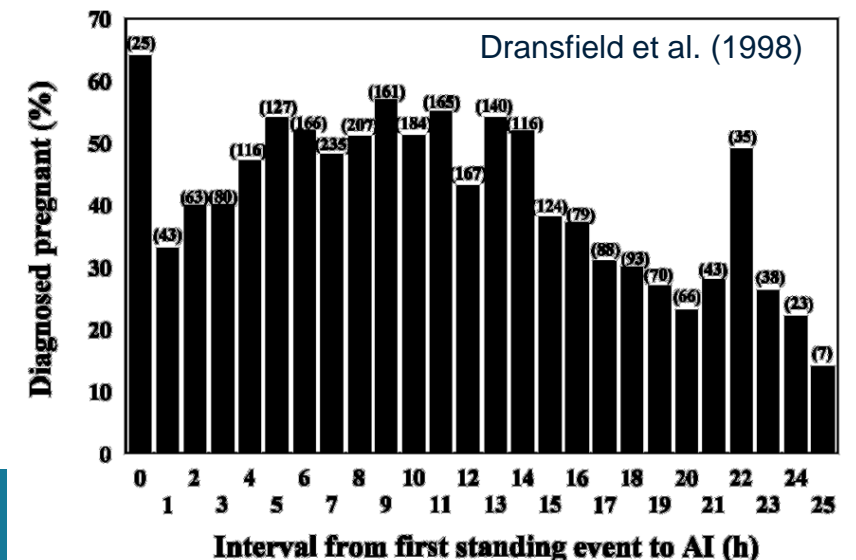
Highest chance on successful conception

→ Optimization of calving interval

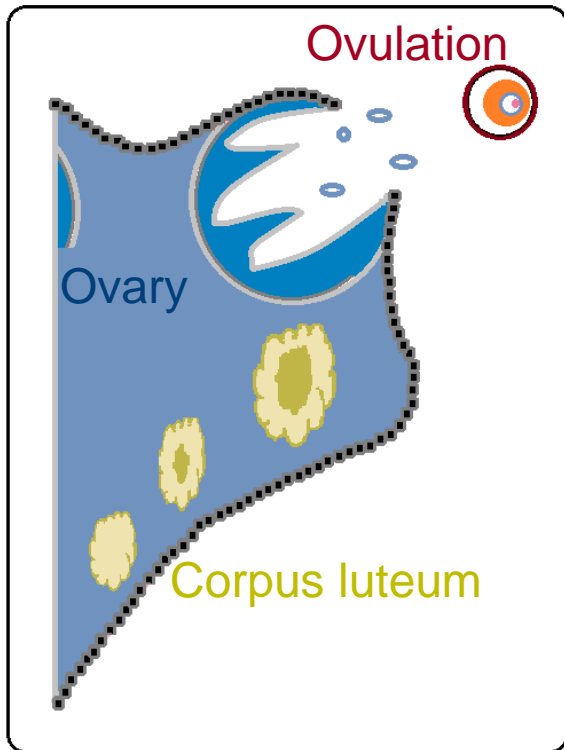
- Time of ovulation

- Energy & health status
- Hormone functioning
- ...

- Research for ability to predict time of ovulation
= needed, but not obvious



Requirements to assess time of ovulation



Sensitive, all ovulations detected

Easily interpreted

Accurate, window 6-12 h

Limited cow-impact

Limited experiment impact

Feasible labor-wise

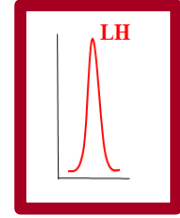
Cost-effective

Possibilities to monitor time of ovulation

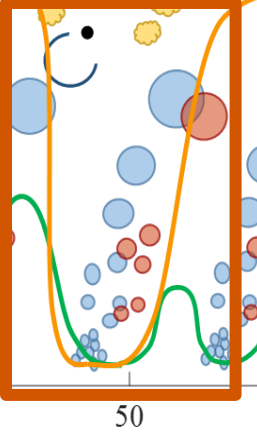
1



2



3



4



DIRECT METHOD

INDIRECT METHODS



Trials

Objective: Evaluate **variability** in the relation of **heat detection attentions** with **time of ovulation**

- Visual observations, activity attentions, luteolysis ~ *milk progesterone*

Successful conception

- (-) Sensitiveness ~ early embryonic deaths
- (-) Accuracy – no window 6-12 h
- (-) Effect of sperm & oocyte quality
- (-) Effect of cow condition
- (-) Dependency on inseminator's availability

- (+) Limited cow & experiment impact
- (+) Cheap
- (+) Easy interpretation

Progesterone dynamics

- (-) Progesterone included as detection system
- (-) Accuracy – no window 6-12 h

- (+) Limited cow & experiment impact
- (+) Easy visual interpretations



Trial 1

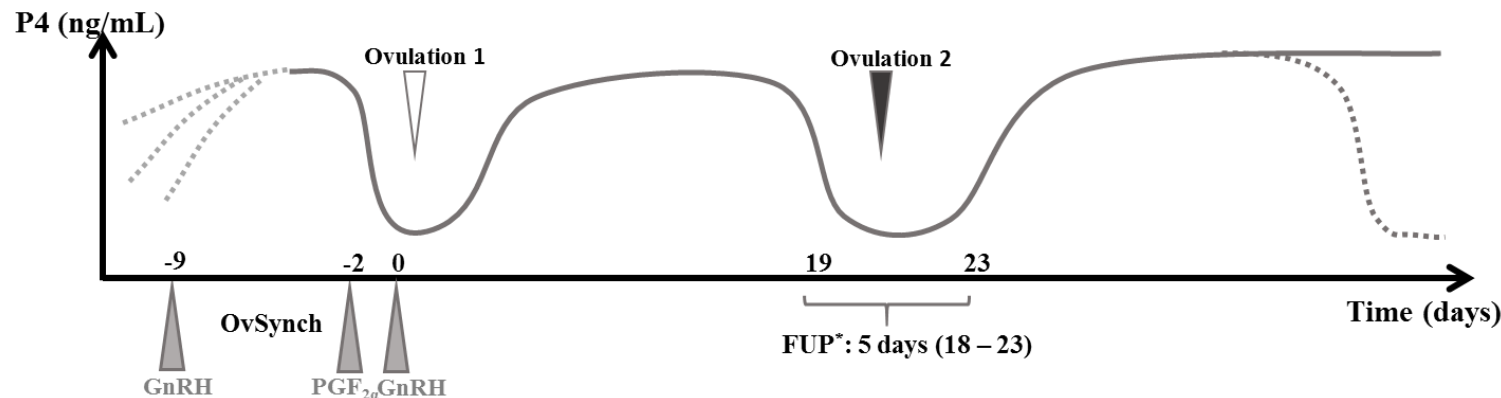


Ultrasonography

- Very precise ~ scanning interval
- Sensitivity ~ identify when start scanning?
→ L: observation of visual symptoms
- Interpretation
 - Feasibility labor-wise
→ L: scanning without manipulation (?)
- Cow & experiment impact

In practice

- ➔ Both ovaries scanned each 6 h
- ➔ OvSynch + wait for next estrus - 1 week
→ L: effect synchronization not described
- ➔ Same person to interpret U/S images
 - Write down all ovarian structures: time!
 - Manipulation of ovaries/reproductive tract needed
- ➔ 16 cows ± 1-1.5 h fixed – 20 scans/animal



Trial 2

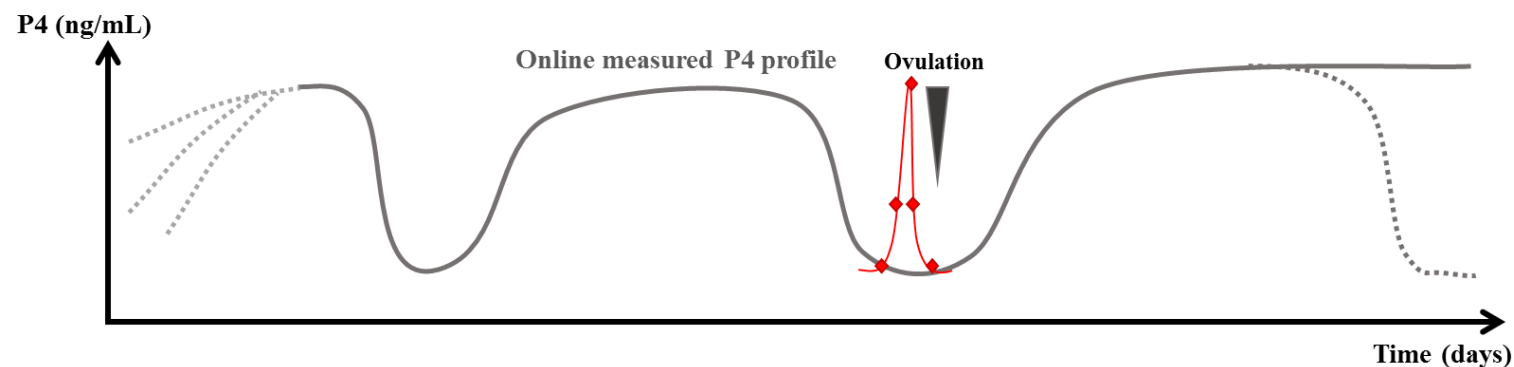


Preovulatory LH surge

- Preciseness ~ consistency link LH - ovulation
→ L: less precise than U/S (?)
- Sensitivity ~ identify when start taking samples?
- Interpretation
 - Feasibility labor-wise
- Cow & experiment impact

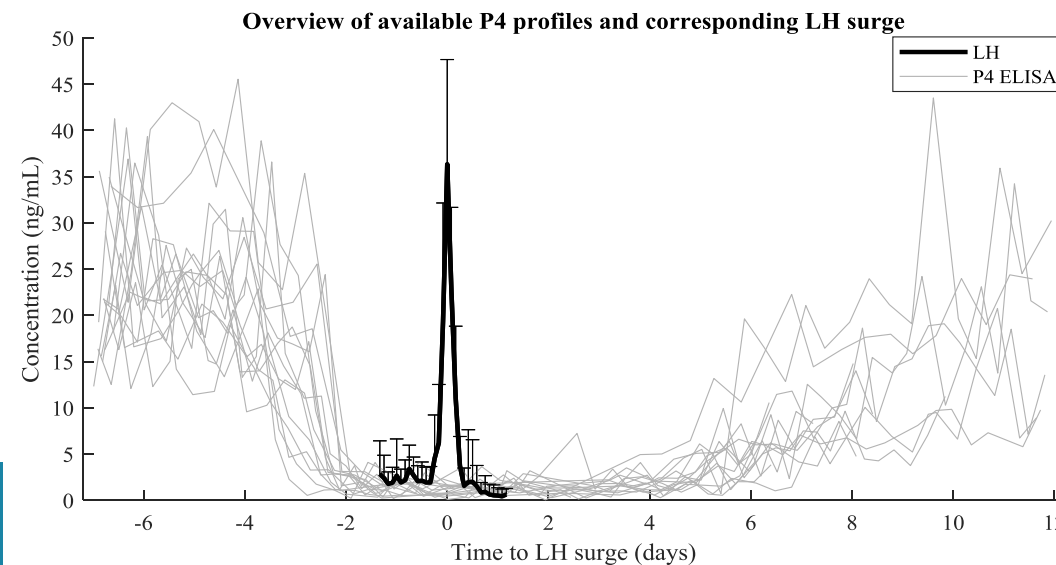
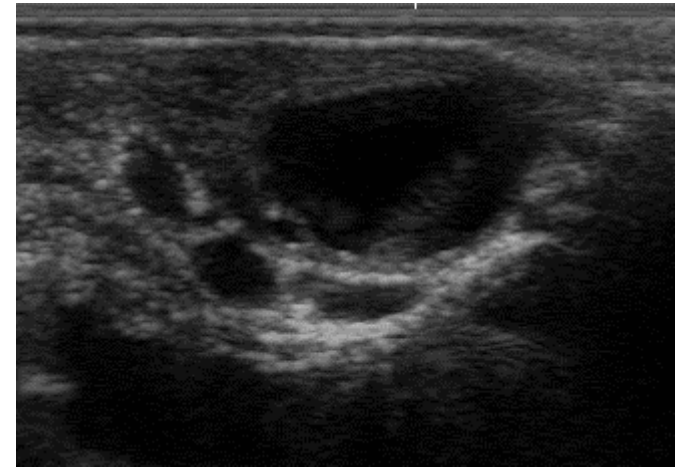
In practice

- ➔ Serum samples taken each 2 h during 72 h
- ➔ Via online P4 analyzer: preliminary test
 - 1x / day: U/S ovaries luteolytic cows
- ➔ Teamwork – labor split up
 - Post-hoc analysis & interpretation
- ➔ No synchronization needed / max 5 cows each
 - Restraining / taking samples: fast / little impact



Conclusions

- No method available that fulfills all requirements
- Best methods:
 - Monitoring disappearance preovulatory follicle using ultrasonography
 - Direct method / interpretation not straightforward / labor intensive
 - High-frequent blood sampling for LH-analysis
 - Indirect method, but good correlation with ovulation / shared labor / expensive analysis kits



Questions?



Ir. Ines Adriaens
Ines.Adriaens@kuleuven.be

<https://www.biw.kuleuven.be/biosyst/mebios>



KU LEUVEN