

Dairymaster MooMonitor

The app for heat detection & results of on-farm studies.



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Dairymaster, Causeway, Co. Kerry, Ireland.



Experience the difference...
www.dairymaster.com

Dairymaster Global Headquarters



www.dairymaster.com



Dairymaster

- Established in 1968.
- Head office in Causeway, Co. Kerry, Ireland.
- We export > 70% of production.
- Dairymaster has always recognised that its not about what our product does but rather how does our product make dairy farming more profitable, enjoyable and sustainable that matters.
- We have always aimed to make a better product.

A video from Ireland...

Farm Safety

Safe Handling of Livestock

- Research indicates that 65% of all farm injuries are livestock related.
- Bulls are responsible for 59% of livestock related fatalities.
- The bull is the most dangerous animal on the farm.





Artificial Insemination

- Superior genetic progression.
- Health & Safety.



Reduction in labour

- Advancement in technology.

Cow fertility?

- Fertility is very important for farm profitability!
- Better fertility management is possible.
- It makes economic sense to breed better cows!
 - AI should be used where possible.



Heat detection?

- **Teagasc** estimates missed heats to be up to €230 per COW.
- **Esslemont and Kossaibati** concluded that poor heat detection was the main reason for the estimated £200 million per year lost by the UK dairy industry from missed heats.
- **Senger** estimated that the U.S. dairy industry loses more than \$300 million annually due to failure and/or misdiagnosis of estrus.

Physical Activity

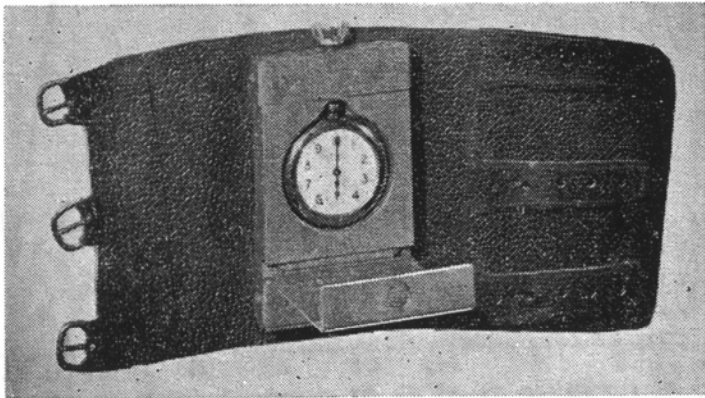


Fig. 1—Pedometer mounted in holder. The instrument is strapped in place on the left leg to record the cow's activity.

Pedometer

Eighty nine years ago was first published recognition that female mammals display a predictable increase in physical activity when in estrus (Wang, 1923).

Farris (1954) described the first potentially useful field application of pedometry in dairy cows.

Kiddy (1976) reported that cows in free stalls were about 2.75 times as active during estrus as when not in estrus. There was relatively little variation within cow in activity from day to day among cows not in estrus.



Counting steps? Real activity?

Clearly more precise activity measurement is required

MEMS Accelerometers...



Accelerometer

4mm x 4mm
1/6" x 1/6"

Accelerometers were developed first for the military, aerospace and automotive industries...

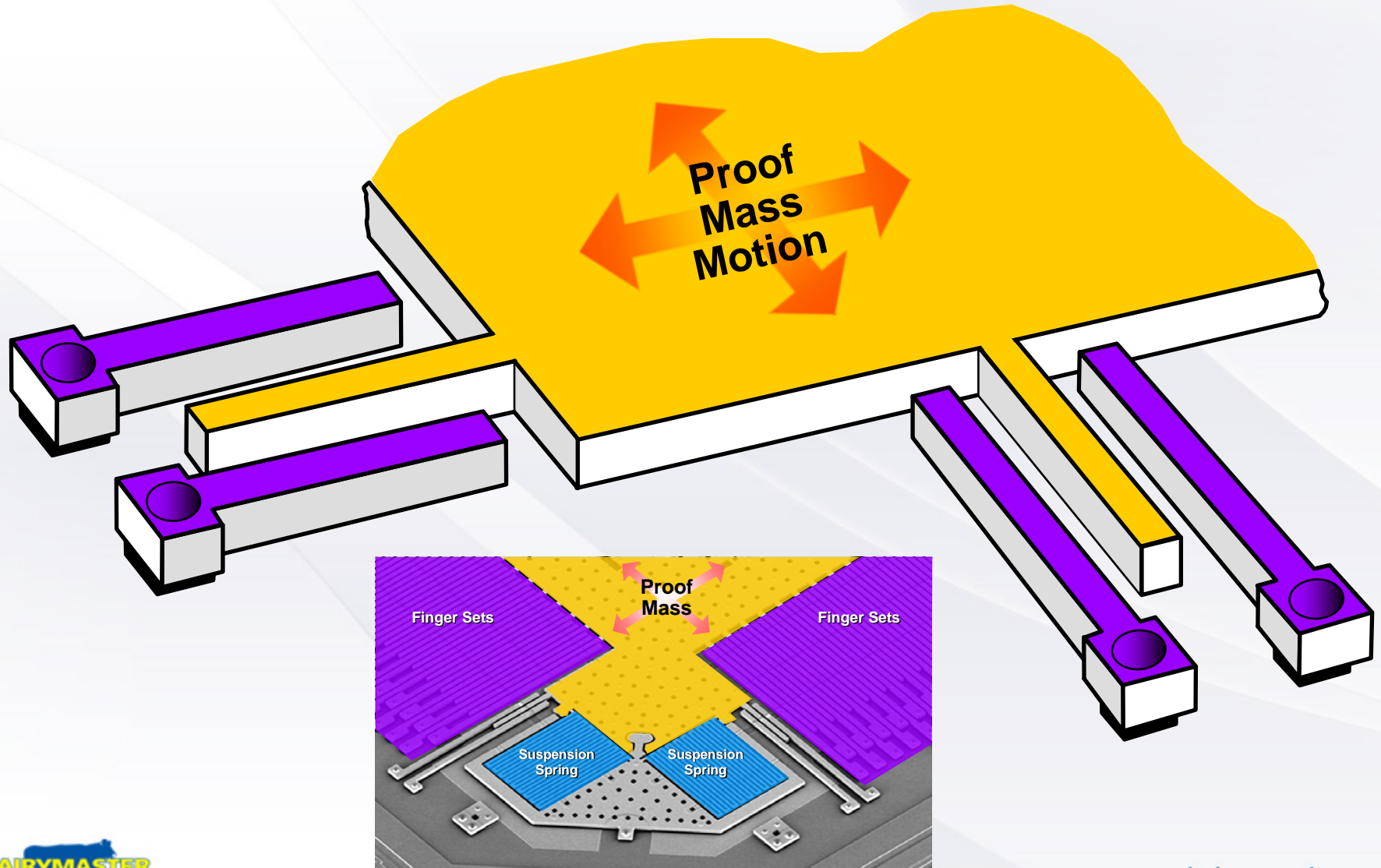
Now they are becoming more popular in industrial, medical and consumer devices for specific types of movement...

Dairymaster was at the start of this curve with state of the art animal activity monitoring...

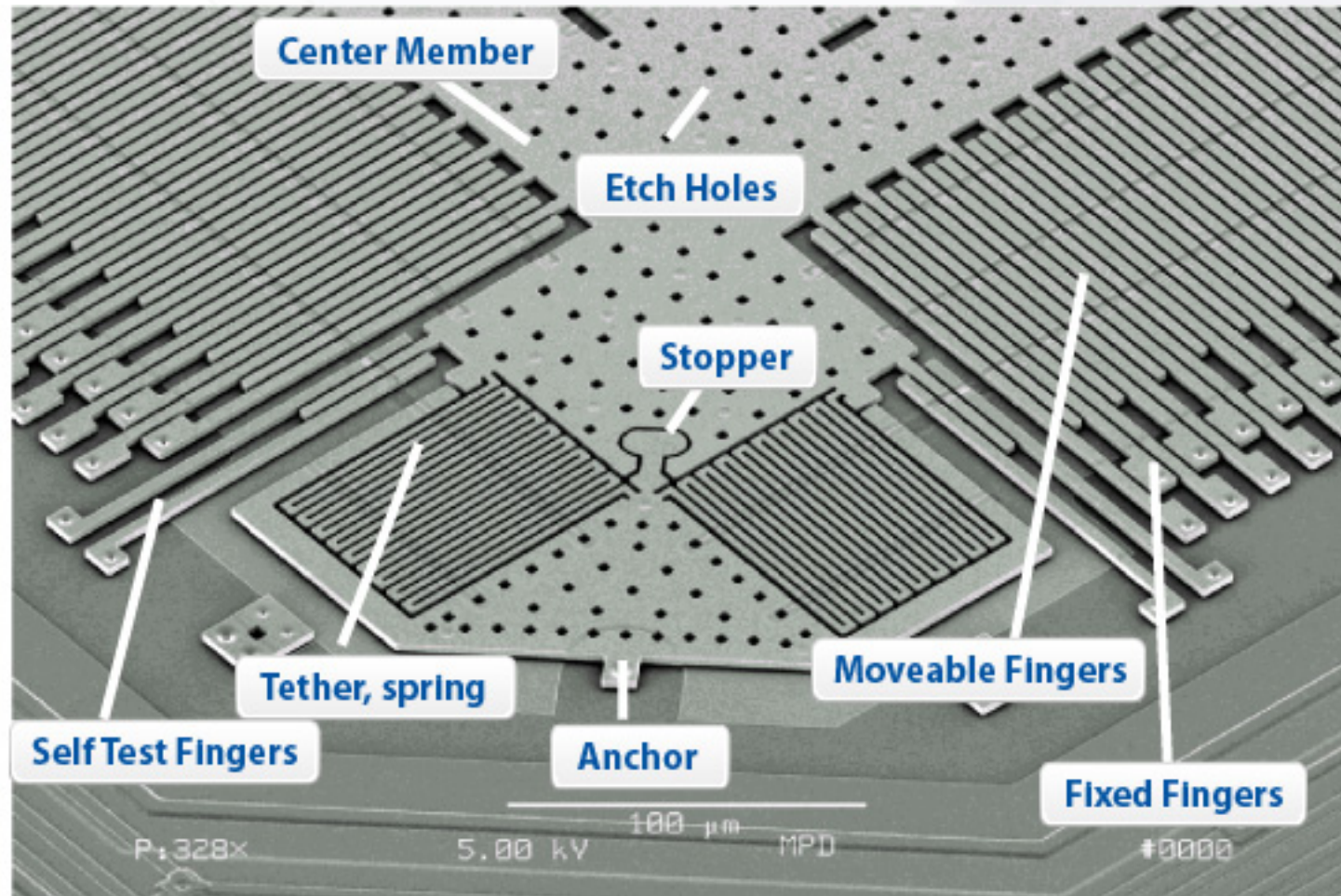


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How do MEMS accelerometers work?



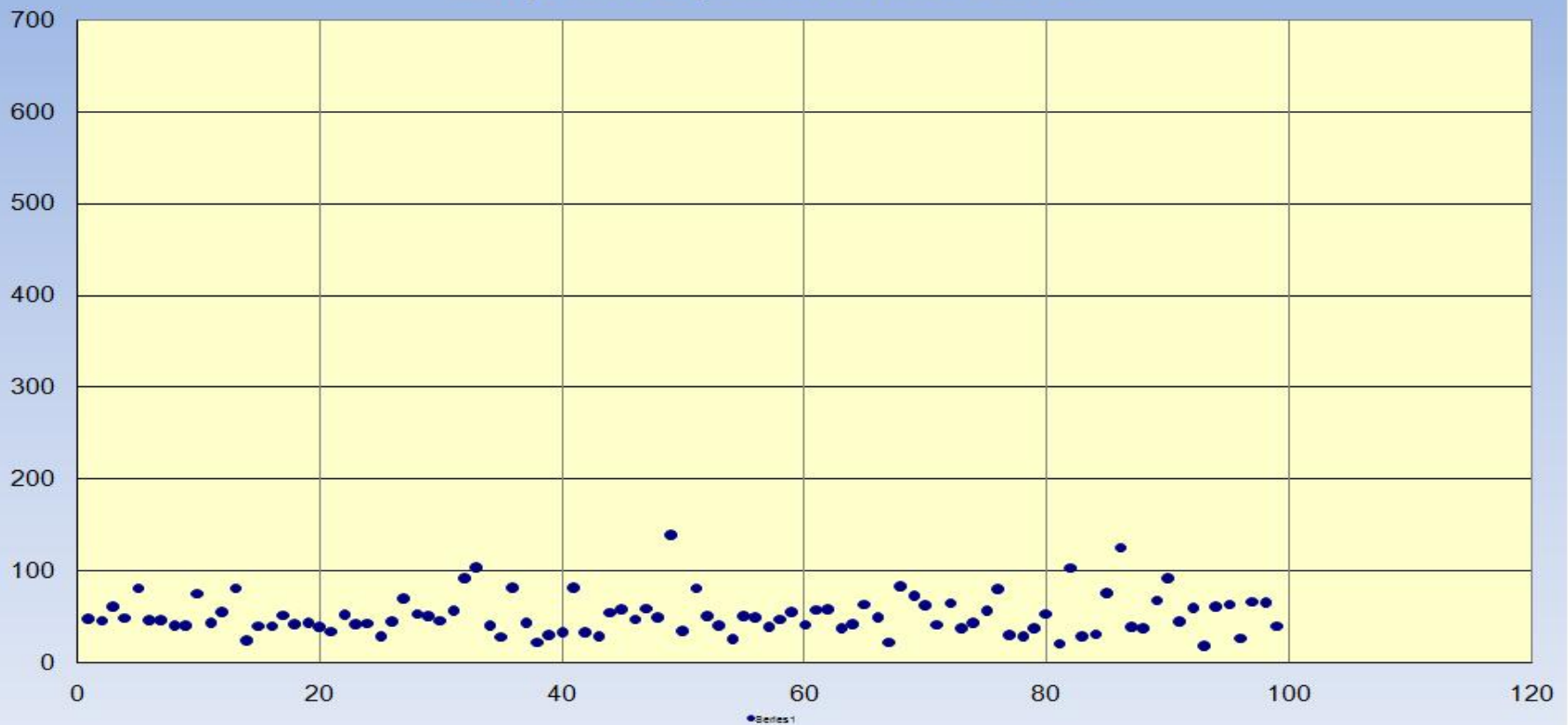
Accelerometer internal micro structure.



Inside Average Daily Activity Levels



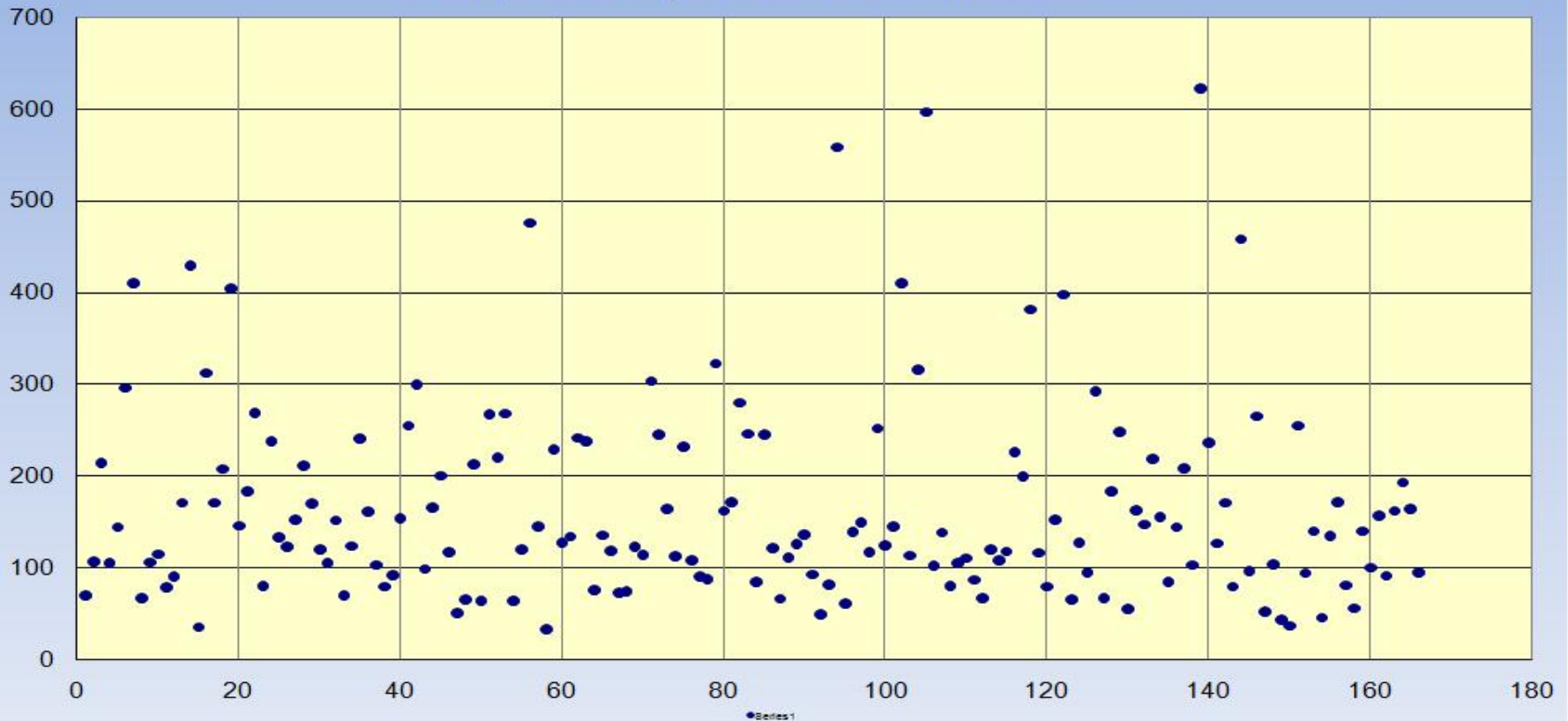
Daily Activity for Housed Cows



Outside Average Daily Activity Levels



Daily Activity for Cows on Pasture



Designed for both...



Pasture-based systems



Housed systems



MooMonitor



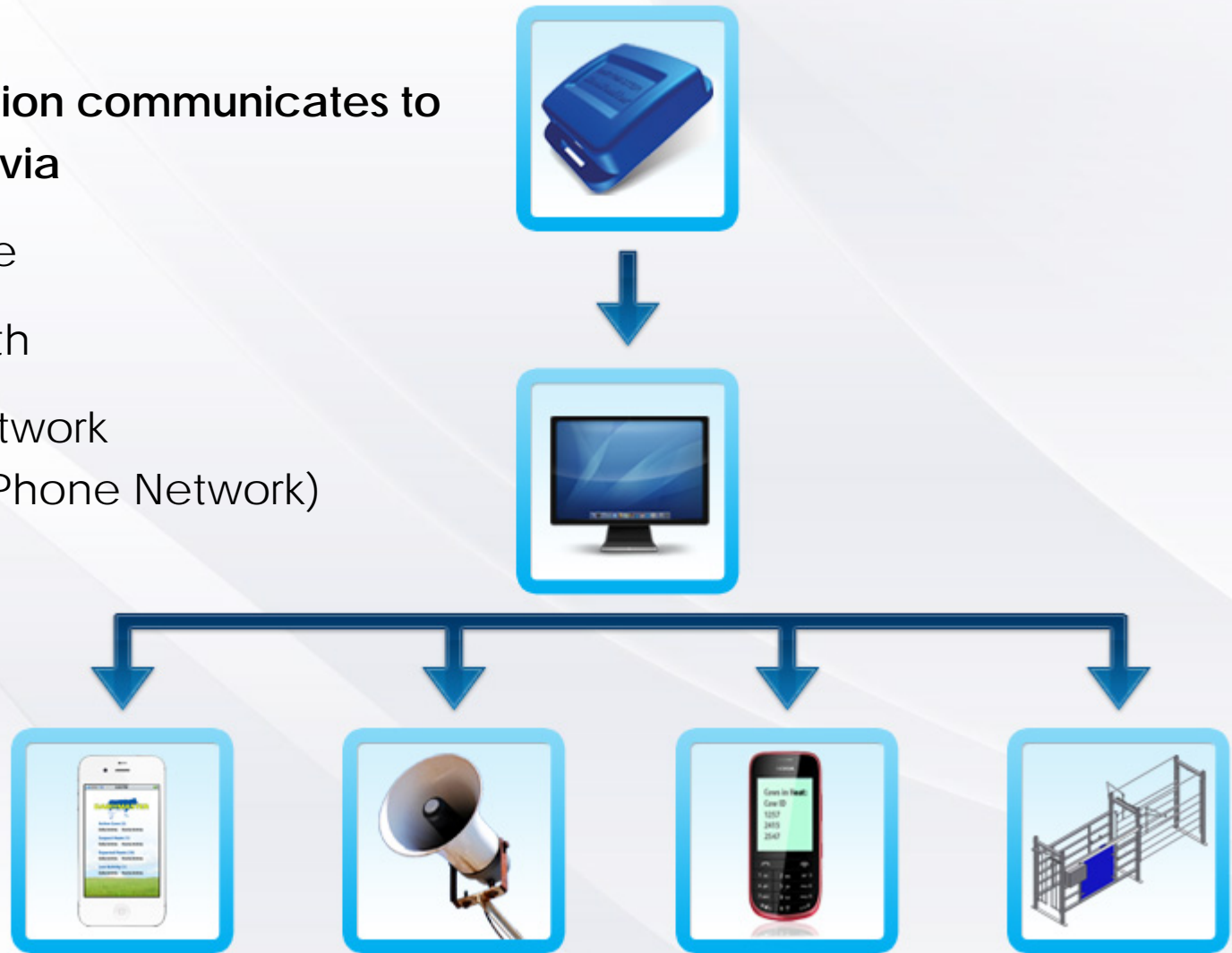
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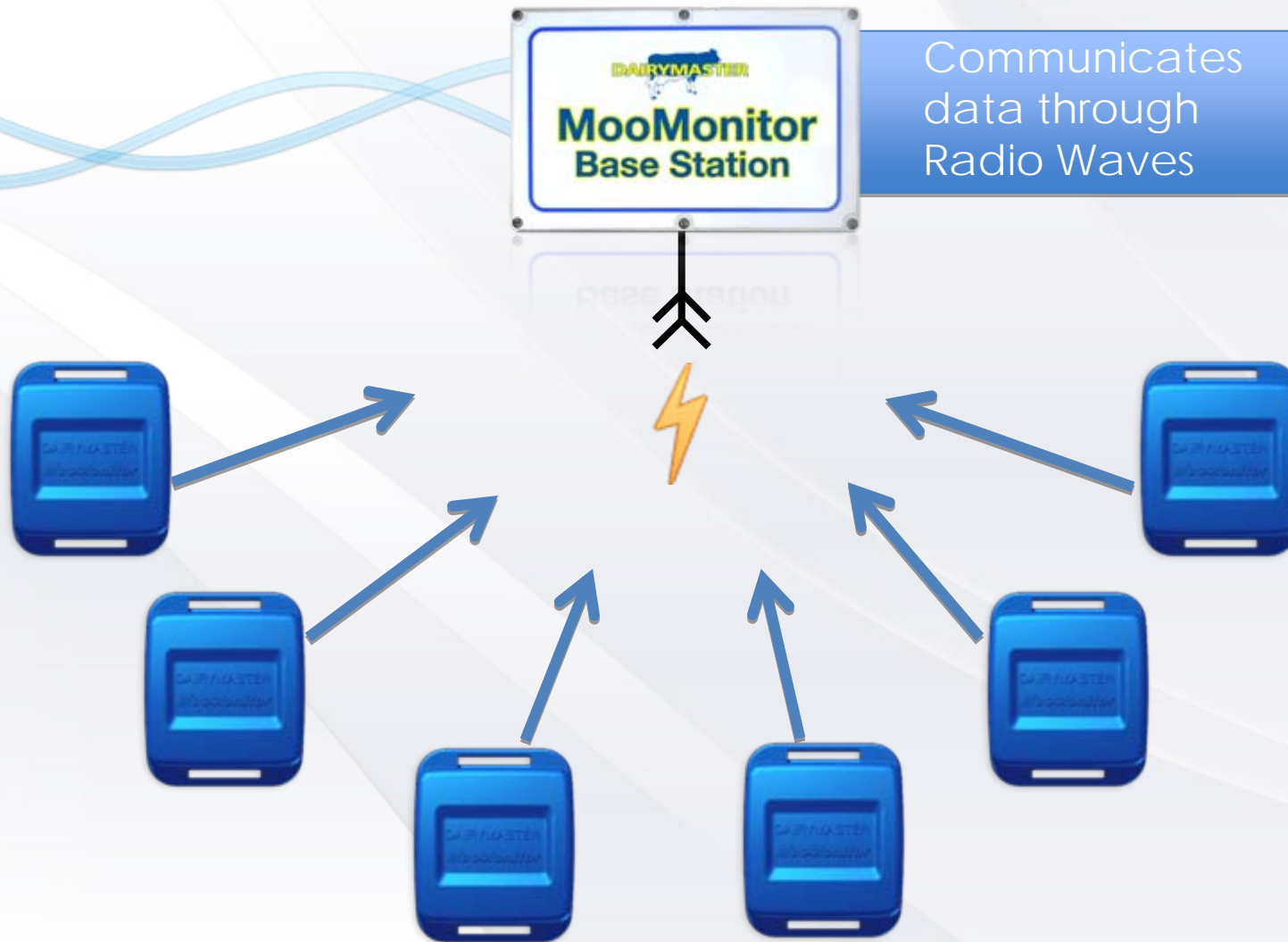
System Overview

Base station communicates to
Desktop via

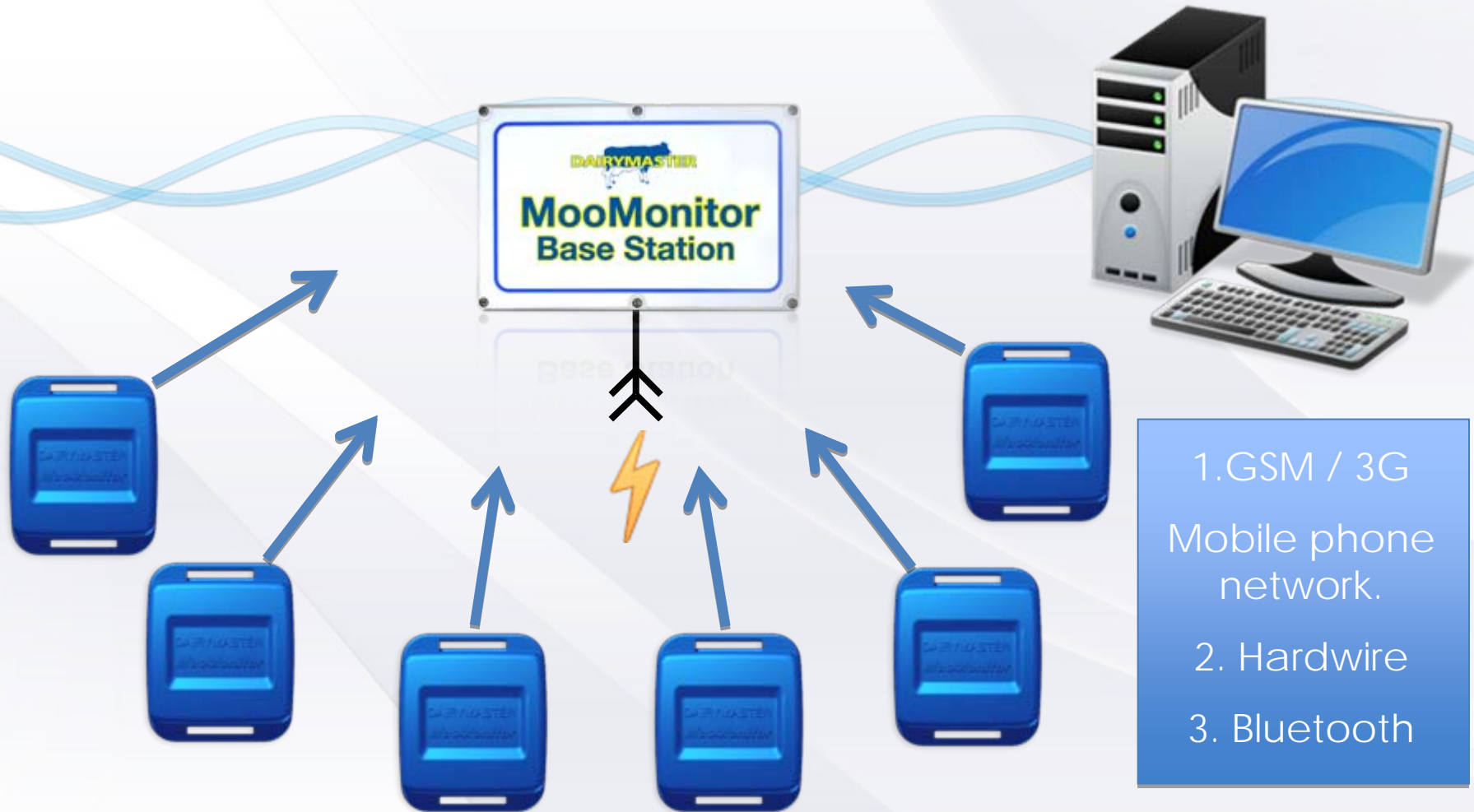
- Hardwire
- Bluetooth
- GSM network
(Mobile Phone Network)



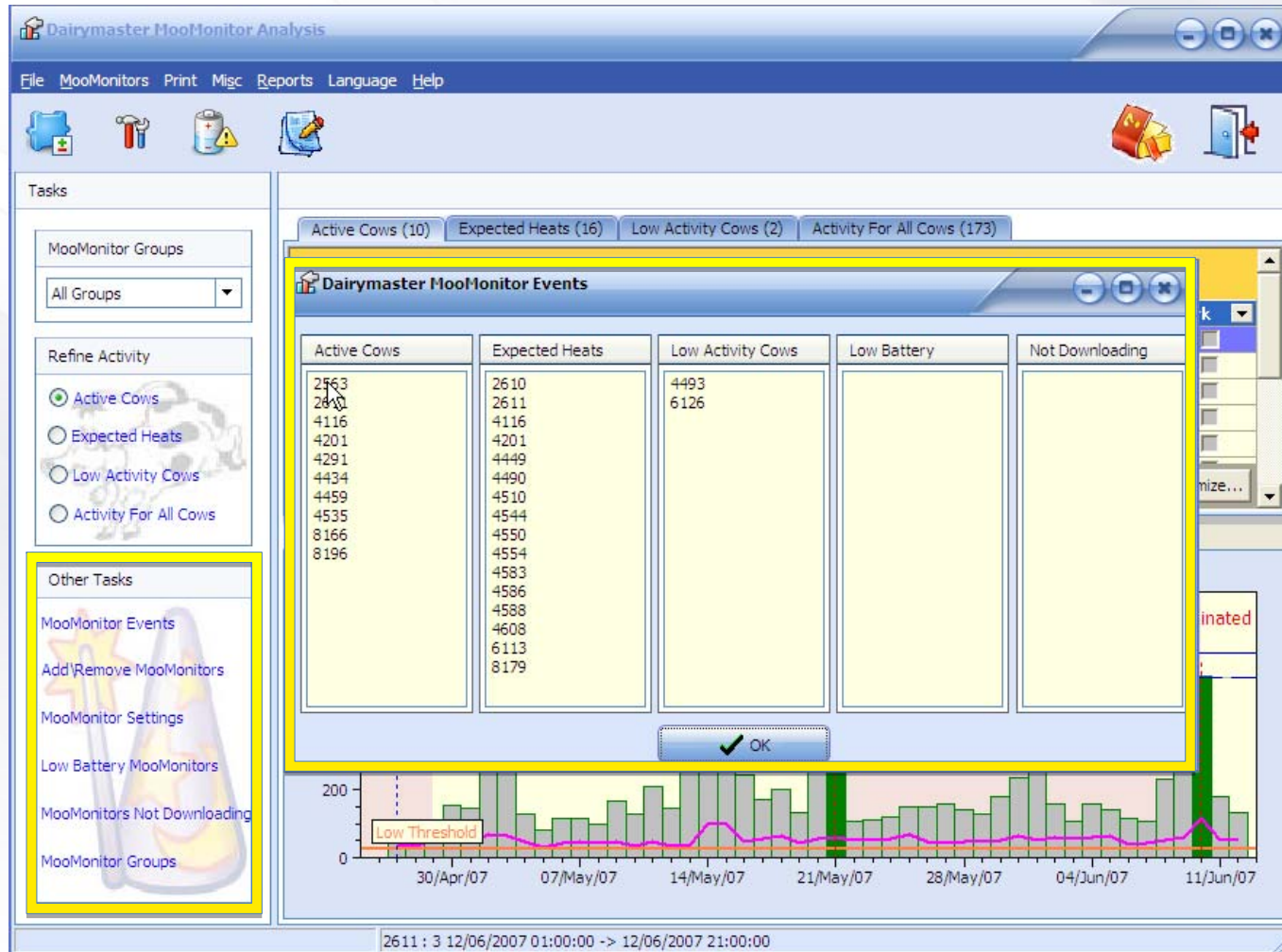
Base station in collecting yard or housing.



Remote base station – typically off farm heifer rearing.

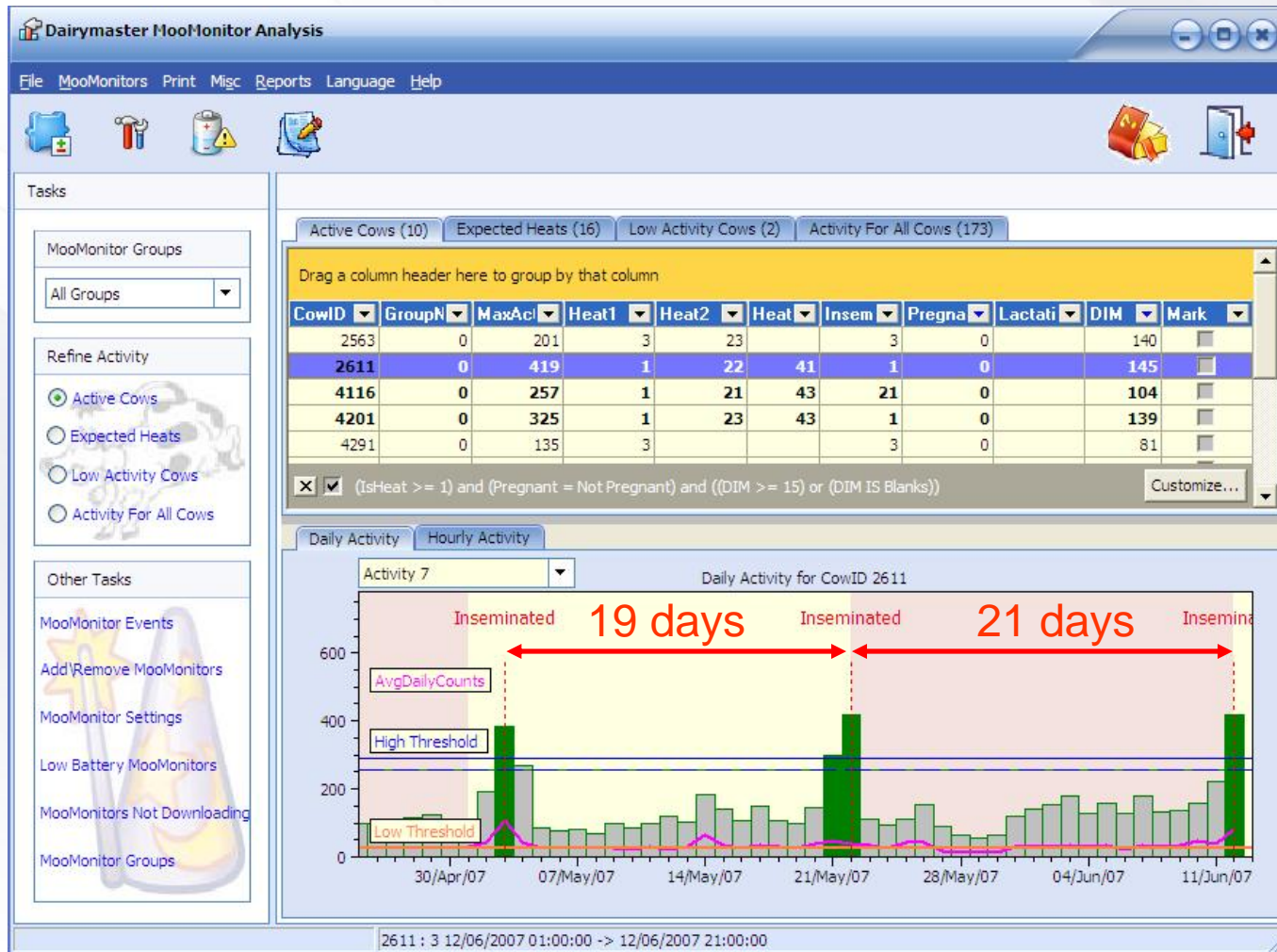


User interface



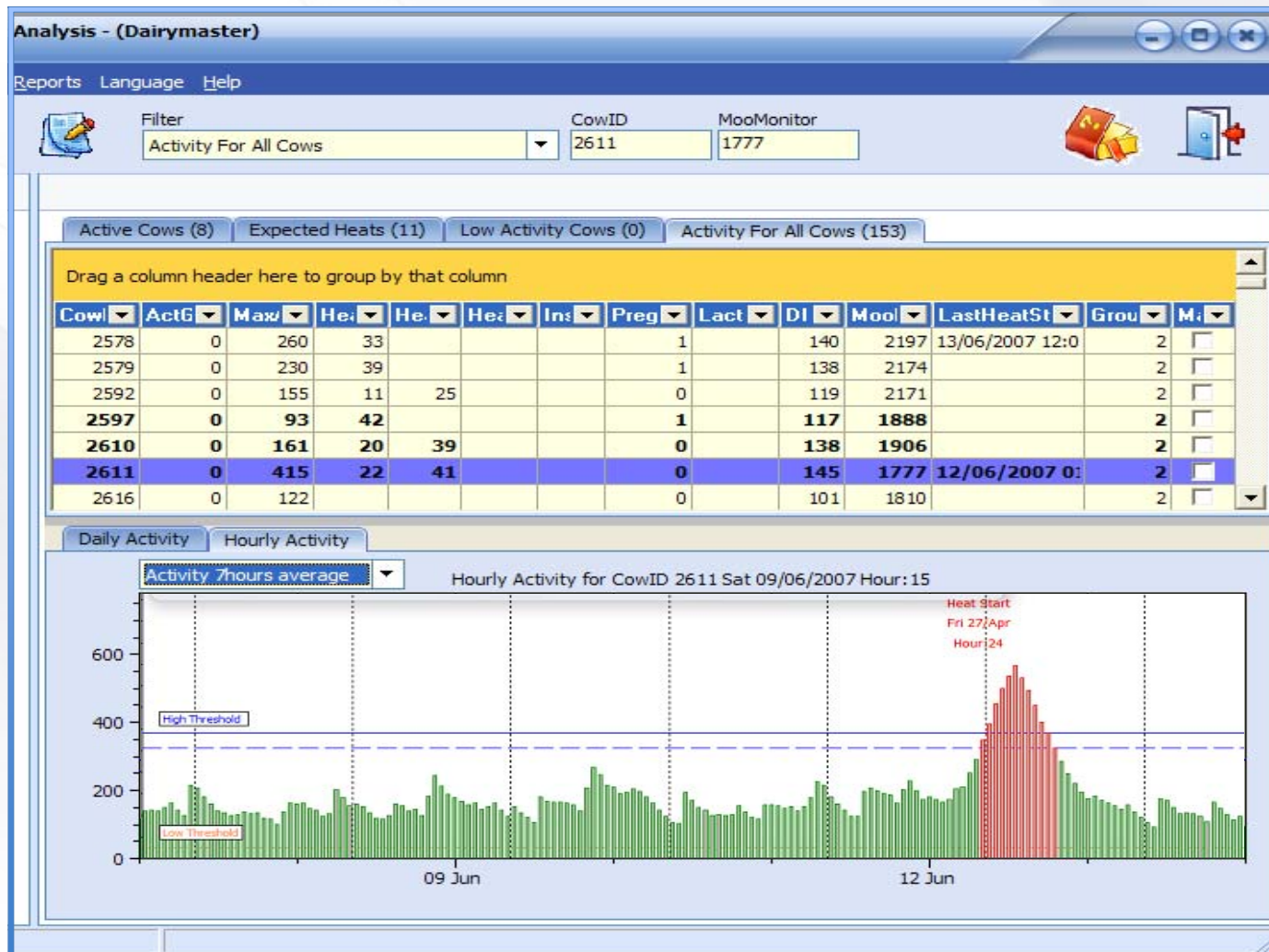
- Summary screen appears on loading.
- Tabs show individual data.
- Most used items appear on "Other tasks" list.

User interface

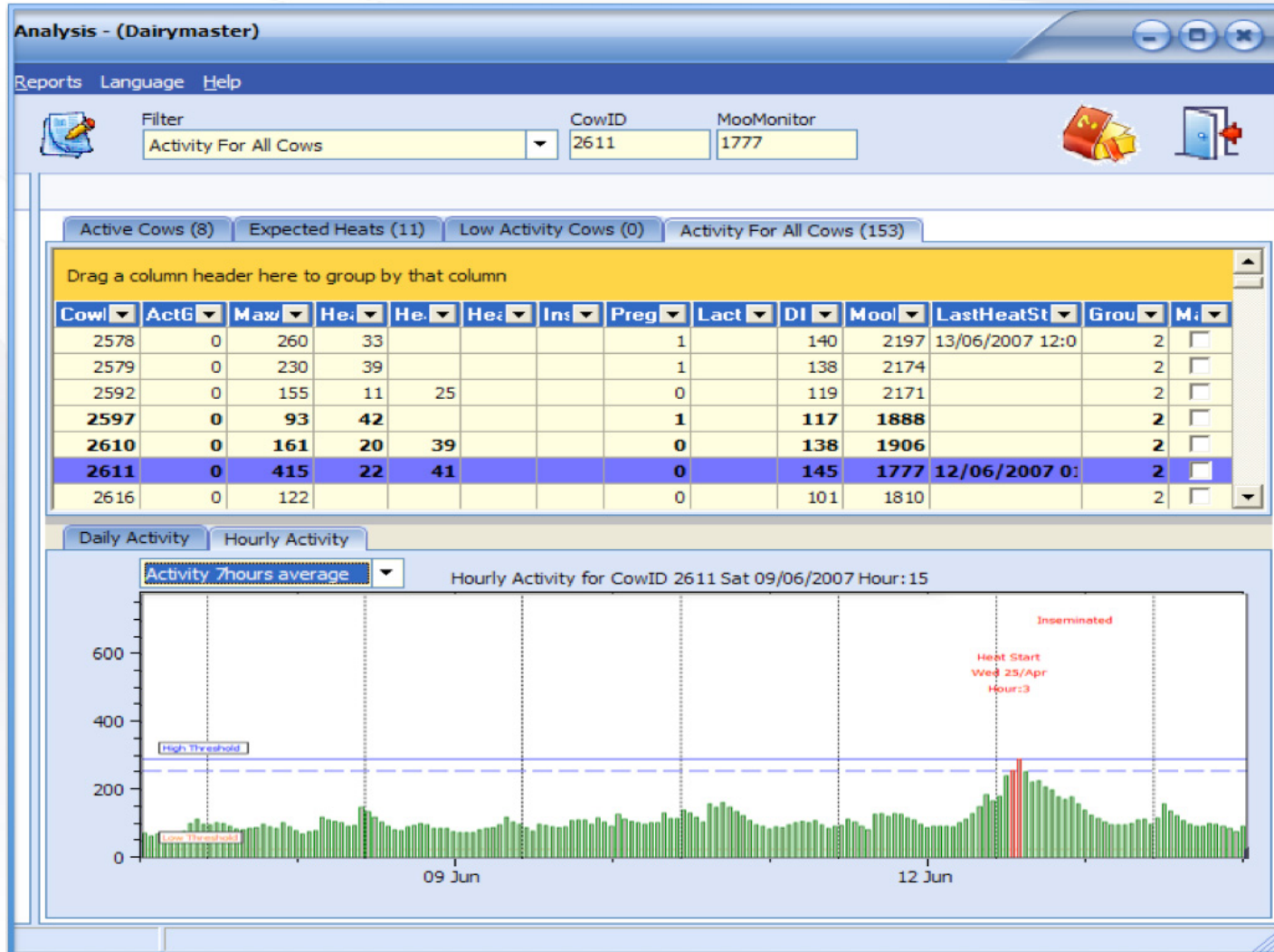


- Background shading changes every 21 days.
- Easy to see last cycle is 21 days.
- Previous cycle is 19 days.

Hourly measurement

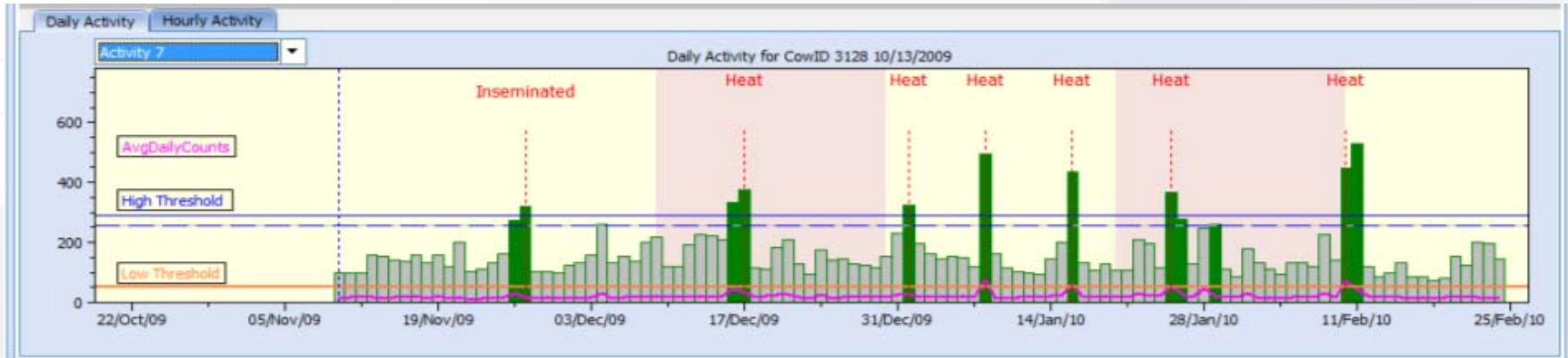


Silent heat

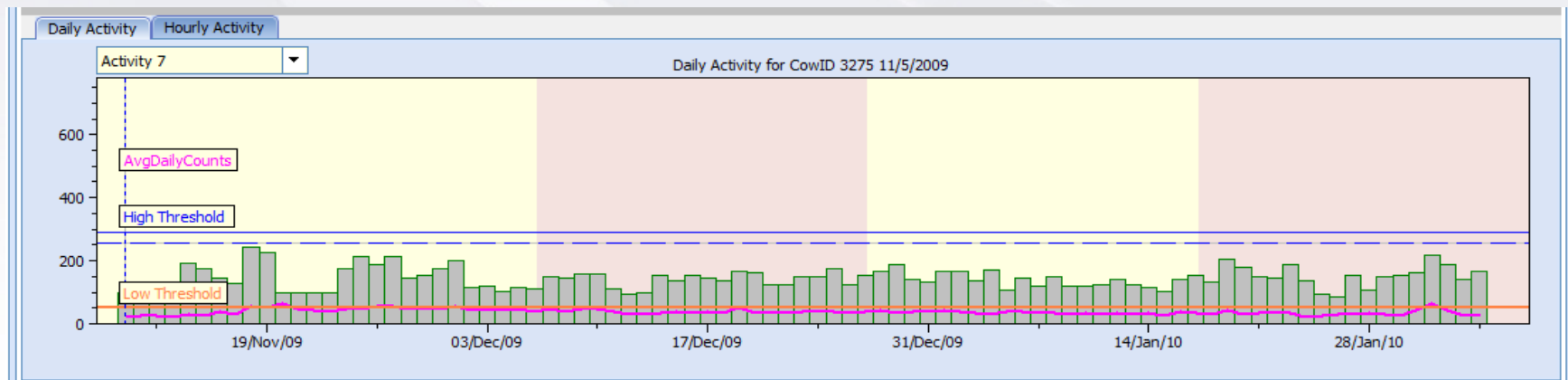


Other Reviewing Capabilities: Cystic Cows and Non-Cycling Cows

Detect cystic cows

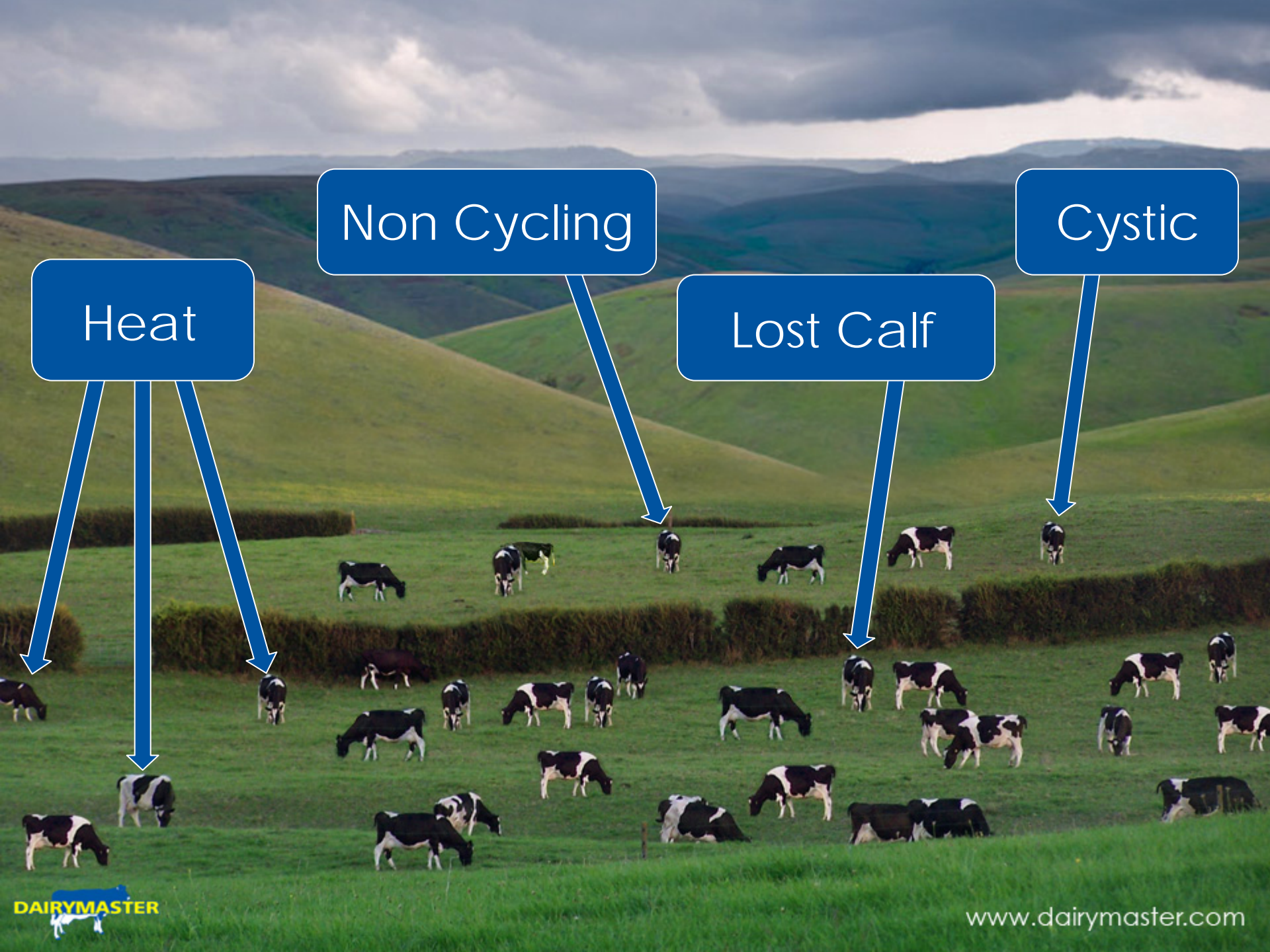


Detect non-cycling cows



More herd information anytime, anywhere





Non Cycling

Cystic

Heat

Lost Calf

Mobile App

Getting more information to
the farmer and A.I.
Technician sooner



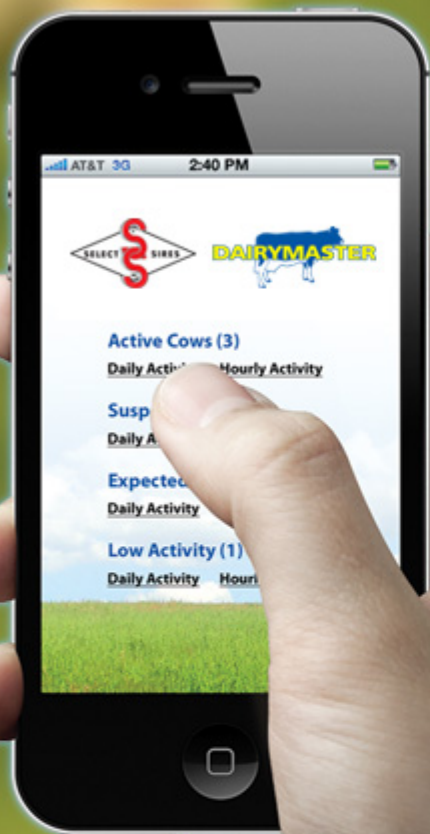
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Mobile app

- The app allows the user to view the data directly on a mobile phone allowing for 24-hour remote monitoring.
- The AI technician or dairy producer can now remotely see data on one or many herds.

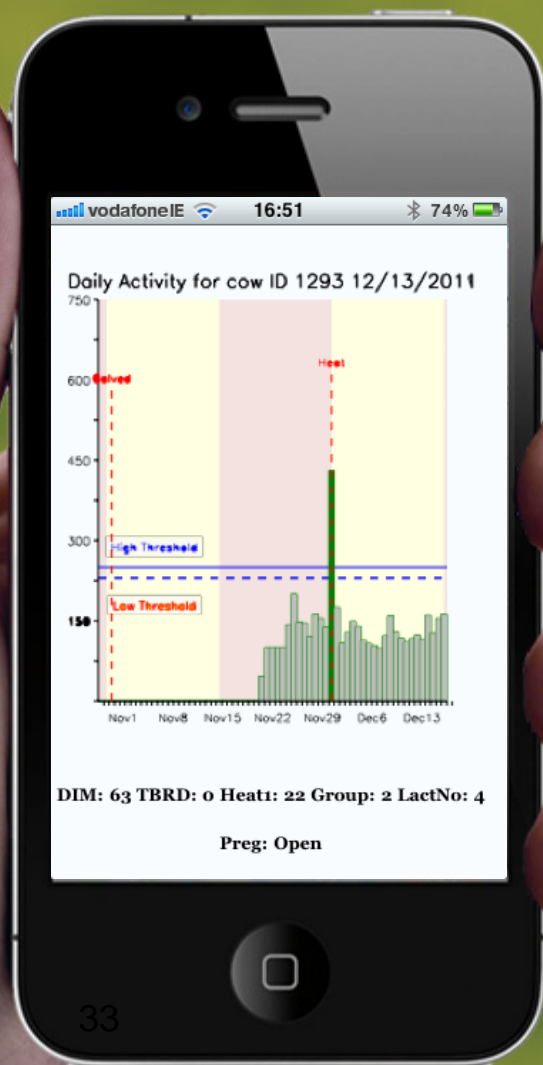




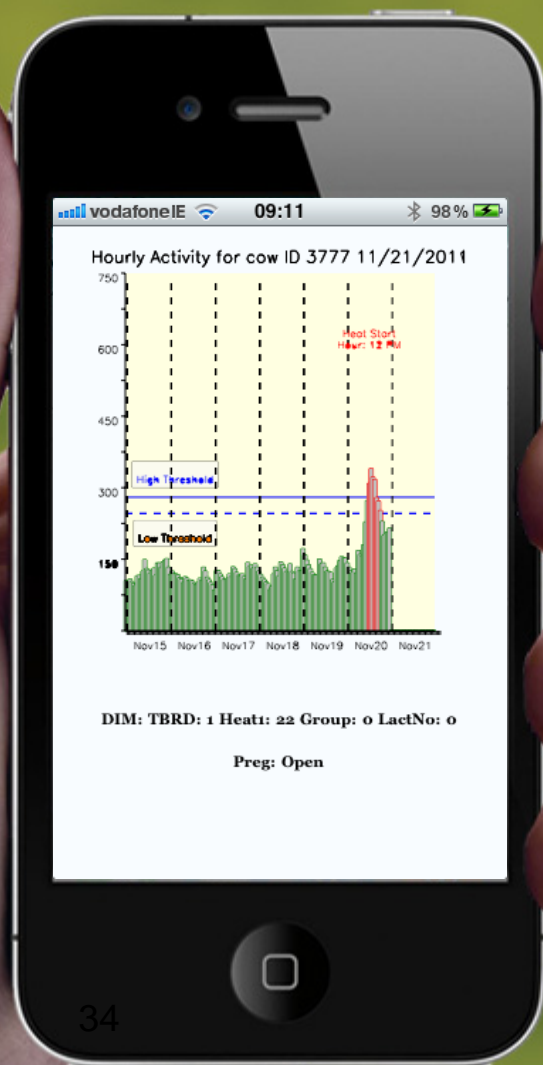
System Overview

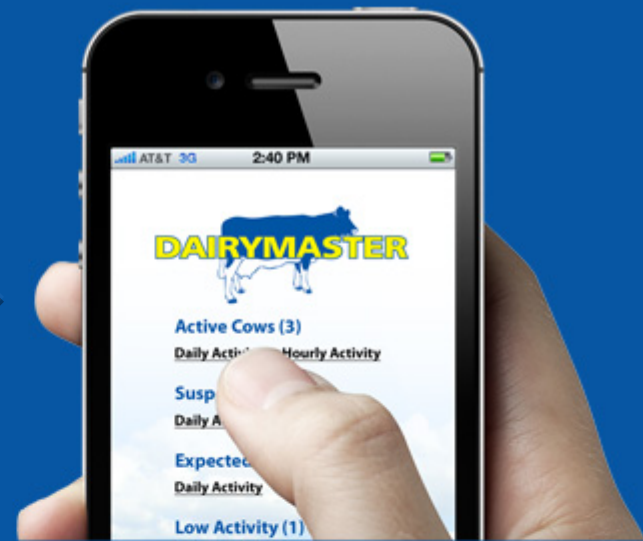


First Heat after Calving



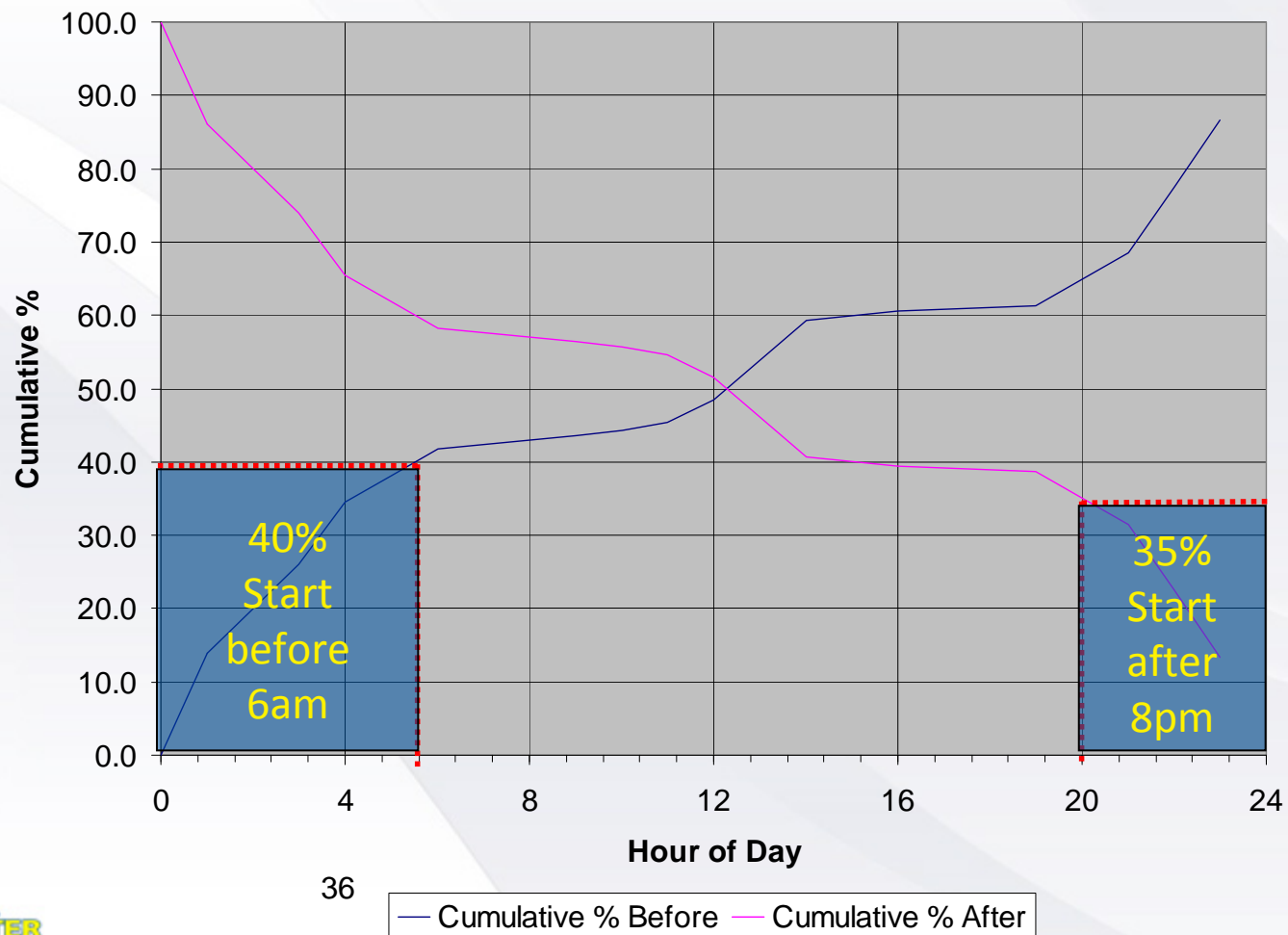
Hourly Graph





When do heats start?

Distribution of Heat Start Time



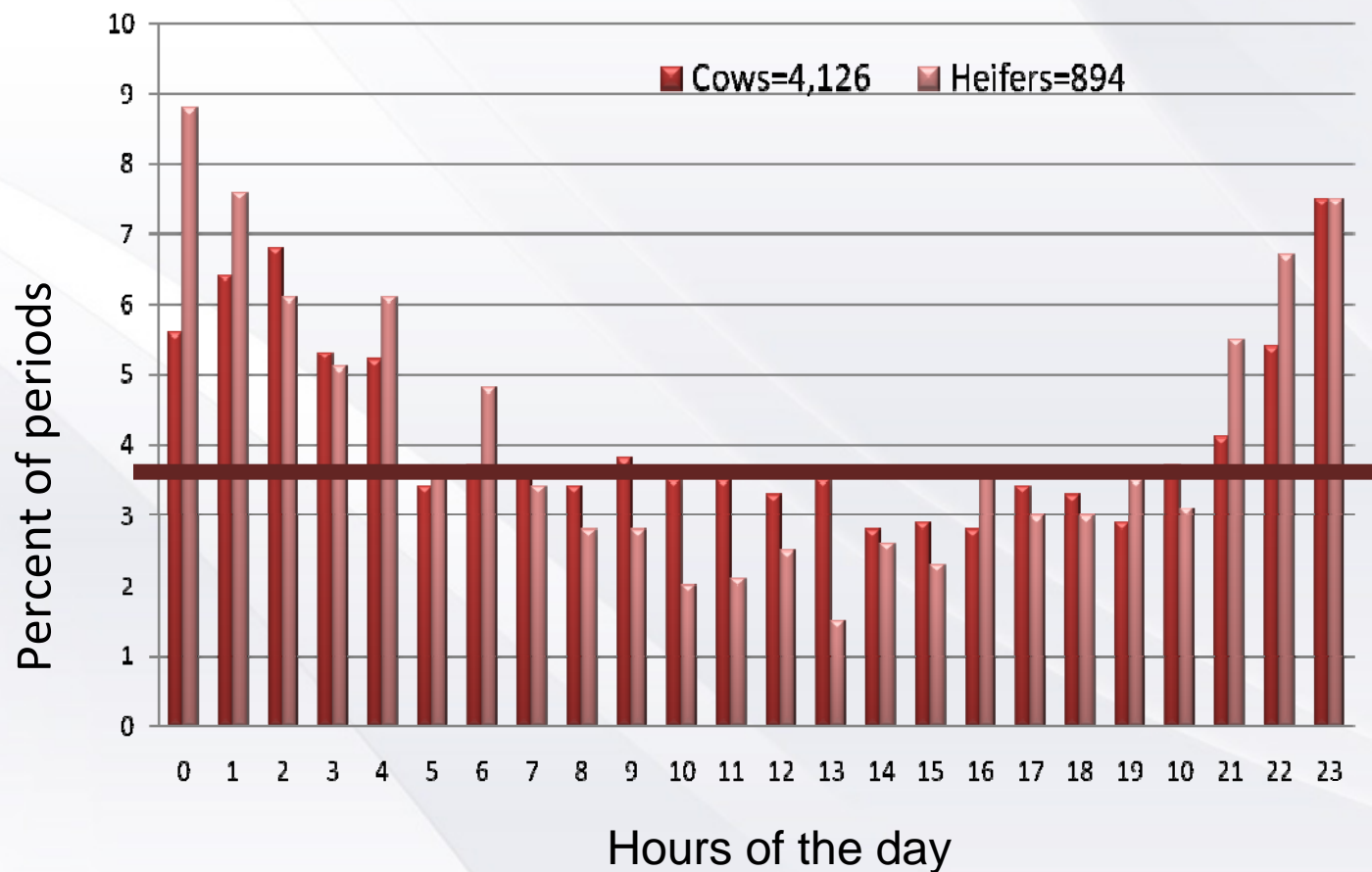
Study on the effect of insemination timing on conception rates of dairy cows having high activity



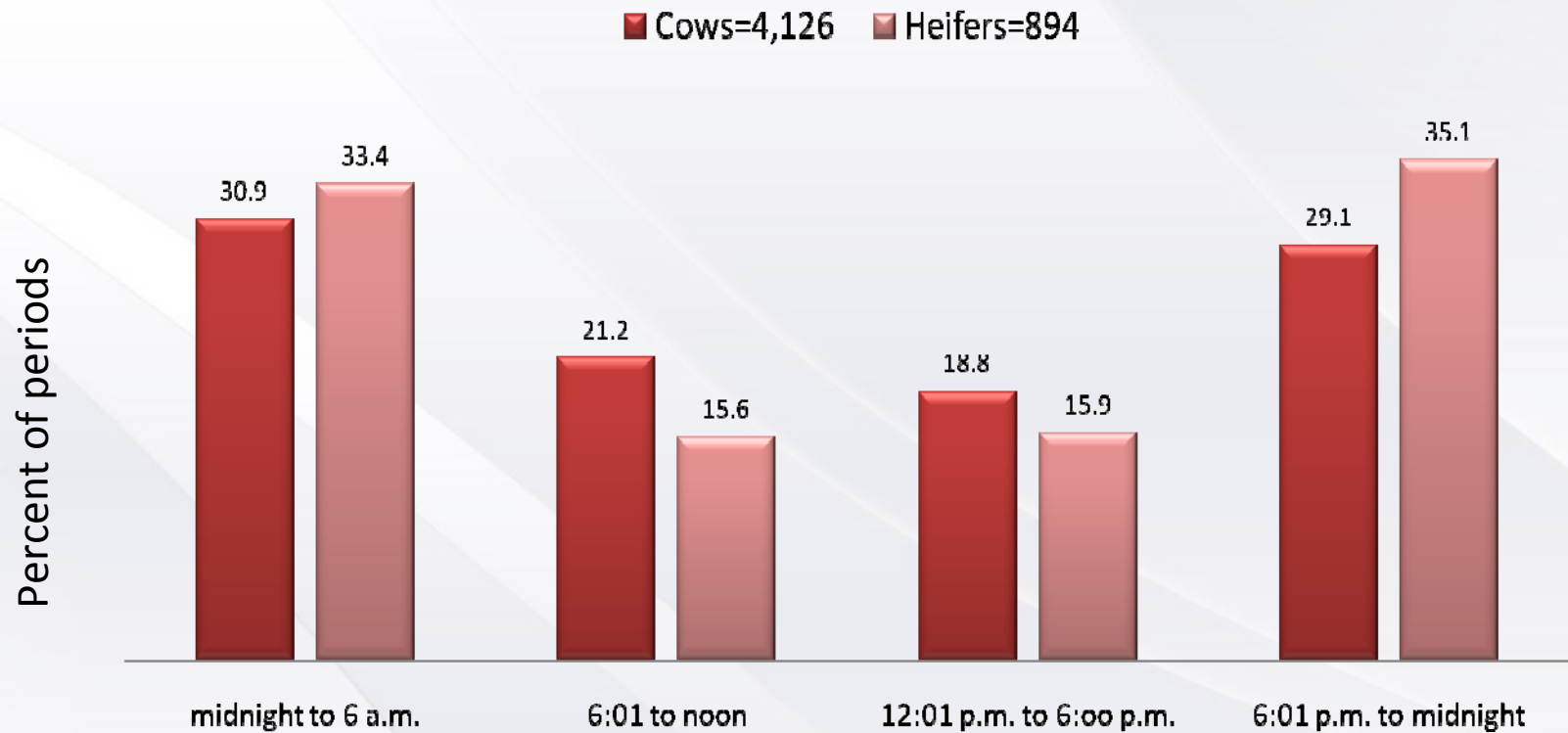
- Conception rates from 4,126 services were recovered from 19 herds located in 8 states
- Dairy personnel recorded time of A.I. in the Analysis Program and time of first “red bar” was used as onset of high activity to determine interval from onset of high activity to breeding.
- LS means analysis of variance was used to determine the effects of herd, parity, service no., duration of high activity, interval from onset of high activity to AI, and all two-way interactions in a backwards stepwise regression.



Onset of High Activity

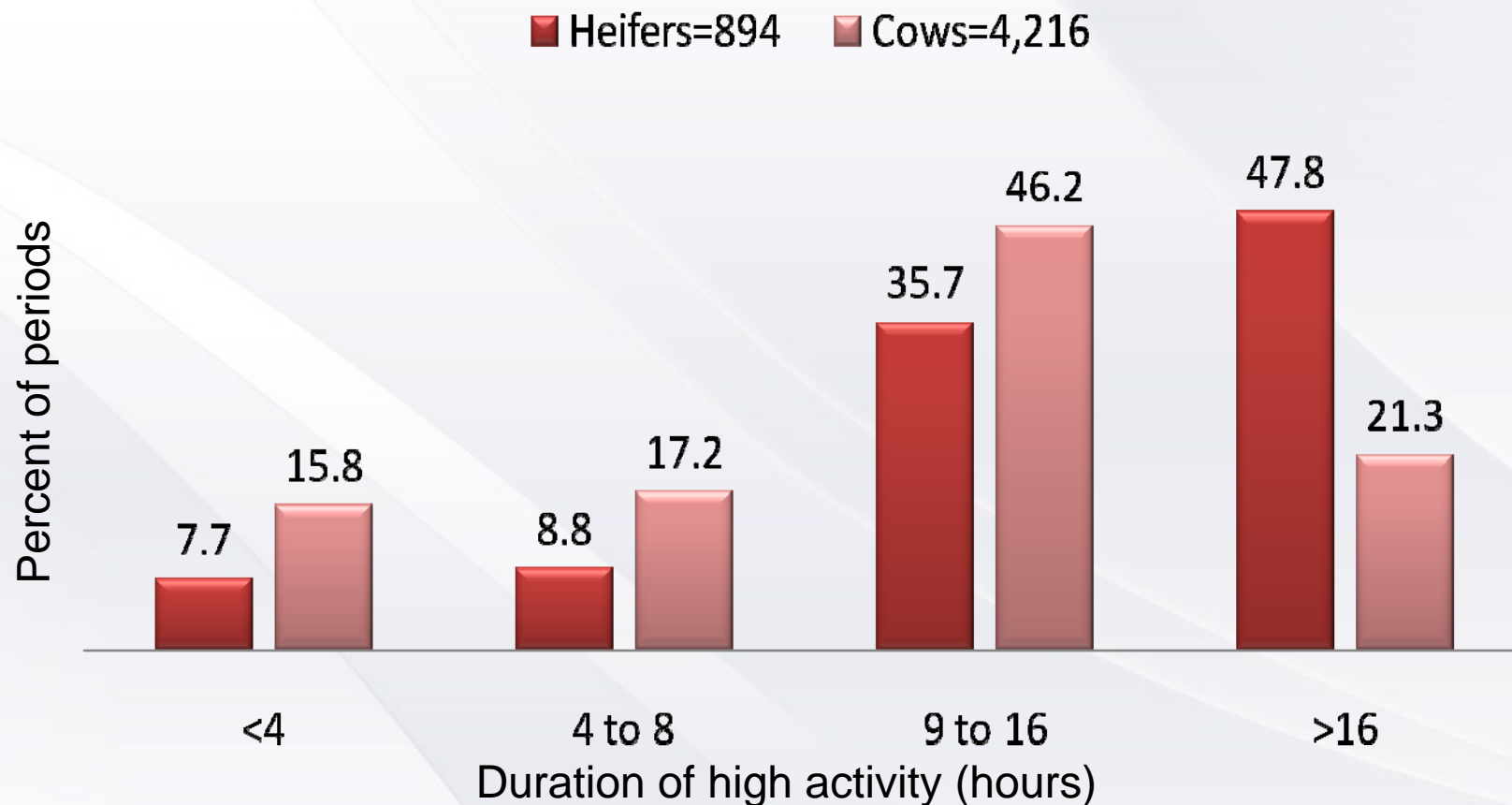


Onset of High Activity



Take home message: Nearly 70% of activity is at night!

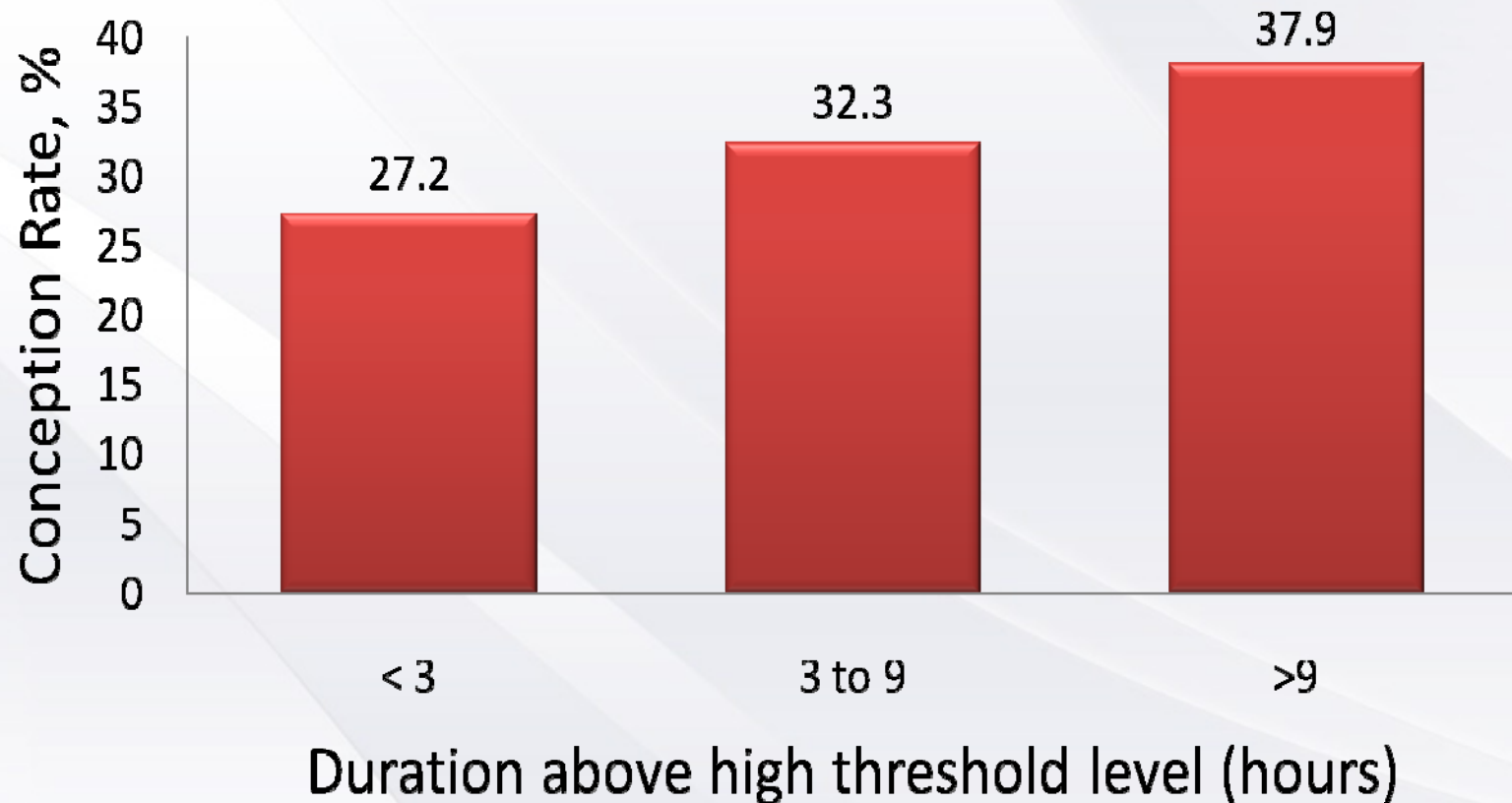
Duration of High Activity



Take-home message: Over 30% of cows have heats < 8 hours.

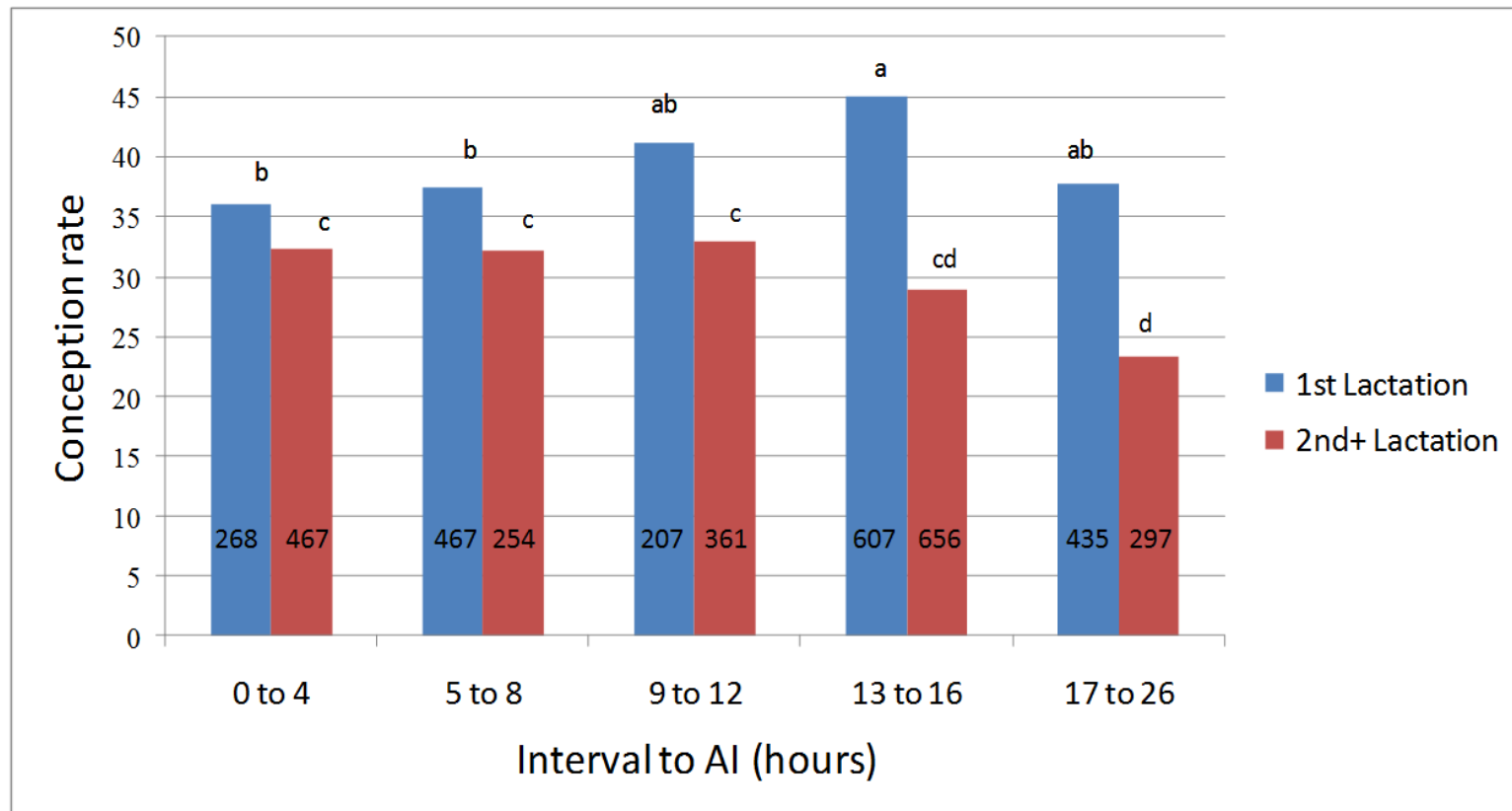
Half of these are less than 4 hours!

Conception Rate by Duration of High Activity



Cows with shorter duration heats have lower conception rates!

Effect of Interval from Onset of High Activity to A.I. on Conception Rates



ab – Means within 1st lactation cows lacking common superscripts differ ($P < 0.05$).

cd – Means within 2nd and greater lactation cows lacking common superscripts differ ($P < 0.05$).

Correct timing of insemination improves conception rates!



Summary

- More confidence and better judgment in knowing when to AI cows
- Increase profits.
- Less labour.
- Safer farm.
- 24 hour monitoring.
- Identify problem cows sooner.
- More management information for better decisions.
- Increased rate of genetic advancement.

Dairymaster is looking
to work with key
partners all over the
world....





Heat detection is now
an app, not an art!