Observations from remote birthing sensor data on the time of day that calving commences.

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A research project (CalfWatch) that uses new technology to remotely monitor calving in extensive beef herds allowed observations to be made on the time of day when cows commenced calving. This information may help provide insights into cattle behaviour around calving and calf loss in northern Australia.

A new system for remotely monitoring calving using intra-vaginal birthing sensors and GPS tracking collars was evaluated at Manbulloo station near Katherine, Northern Territory, Australia. The system enables the time when calving commences and the location of cows at this time to be identified. The birthing sensors start to emit a UHF signal when a rapid temperature change is detected (when they are expelled during calving). The signals are received by antennas in a low-power wireless-area network (LPWAN) and are transferred by a gateway, via the internet to servers owned by the sensor manufacturer (JMB). A calving alert is then sent and is also immediately viewable on a website. It should be noted that alerts are received at the start of the birthing process "when the waters break" and the birth sensor is expelled. Calving usually occurs within an hour after this but in some cases it can take much longer. The cows are also fitted with GPS tracking collars that record location every 15 minutes and this data is viewable in real time on a website enabling cows to be located at the time of an expulsion alert.

Birthing sensors and GPS collars were fitted to 189 pregnant cows on 14 August 2019. The cows grazed in a 2,215 ha uncleared paddock of native pasture and calved 36 to 141 (mean = 90) days after birthing sensor insertion. It was very hot and dry during most of the calving period with mean maximum temperatures of 39.8ºC, 40.4ºC and 40.8ºC in October, November and December respectively, and virtually no rain fell at the site between 10 April 2019 and 2 December 2019 (BOM 2020). As a result, during the dry season months until mid-December, the cows congregated around the single water point for most of the day before leaving in the late afternoon to graze. Sunrise and sunset occurred at about 6:15 and 18:35 in October and 6:05 and 19:05 in December (Sunrise-and-sunset.com 2020).

Calving alerts were recorded for 158 cows and 71% (95% CI = 63-78%, Binomial Exact test) of birth sensors were expelled during daylight hours (6:00 to 19:00) with the peak period being between 12:00 and 15:00 (Figure 1). This differs from the common perception that most calves are born at night and may be due to the fact that the cows grazed at night, as studies in the USA have found that night feeding results in a high proportion of calves being born during the day. Studies in Iowa (Iverson 1981) and Idaho (Jaeger *et al.* 2008) both found that 85% of cows that were fed at night calved between 6:00 and 18:00. While the cows in this study were not fed but grazed extensively, most pasture was consumed at night since they congregated around the water point during the day and there was no grass to graze there due to overgrazing that had occurred around the water point throughout the year. A high proportion of calves being born during the hottest times of day in northern Australia may contribute to calf loss and provides cause for conducting research on providing shade where cattle congregate around water points where there is no natural shade.

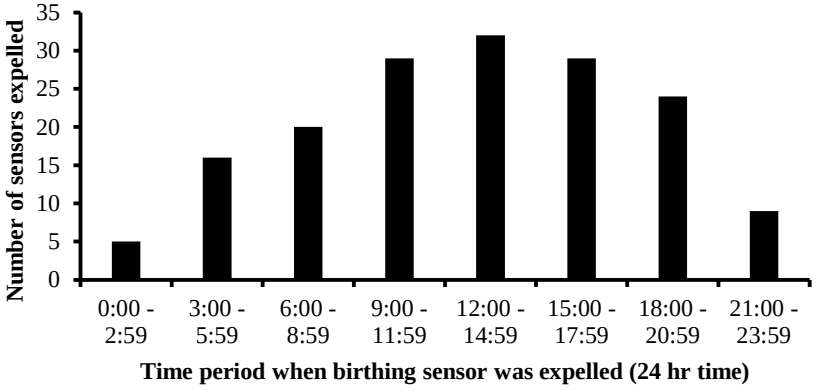

Figure 1. The number of birthing sensors expelled at different times of day.

References

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