

# Evaluation and Validation of Estrus Activity Using Visual Observations, a Heat-mount Detector and an Electronic Activity Monitor in Dairy Heifers.

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Estrus detection using electronic aids can improve reproductive efficiency and minimize the use of pharmaceutical products for reproductive management. The first objective was to validate AccuBreed (AB), an electronic heat-mount monitoring system, against visual observations (VO) and SCR's HeatTime (HT), an automatic activity monitoring system. The second objective was to quantify the intensity and duration of estrus and their repeatability in dairy heifers using the AB and HT systems. To validate AB against VO, 20 Holstein heifers were induced into estrus (+ 2 natural estrus). AB transmitters were attached to each heifer's tail head. Observers recorded mounting activity for 90 min 2x daily for 2 d and detected 14 heifers in estrus during the observation period, whereas 21 of 22 heifers were detected in estrus by AB over 4 d. While 246 mounts were observed by VO in the 360 min observation period, AB recorded only 140 (43% less) with a concordance correlation coefficient of  $R=0.66$ . Of the 140 AB mounts 73% matched with VO. Surprisingly, 38 mounts were registered by AB but not by VO; these unobserved mounts were likely due to transmitters being activated from non-mounting activity. To compare AB to HT 28 heifers were observed with AB and HT for an average of  $98.3 \pm 7.3$  d. During this time, AB recorded 75 estrous cycles while HT recorded 85 for a concordance correlation coefficient of  $R=0.83$ . The low proportion of matching estrous cycles was attributed to faulty or lost AB transmitters. Based on data from multiple cycles of the same animals, both AB and HT indicated that the intensity of estrus behaviour was repeatable, whereas duration of estrus was not repeatable from cycle to cycle.

**Take Home Message:** Despite fewer mounts being recorded by AB and the high incidence of faulty transmitters, estrus detection was possible by AB. Estrus intensity in heifers was repeatable but not the duration of estrus. The AB system was extremely labor intensive, transmitters frequently failed and required weekly patch maintenance; hence cannot be recommended for routine reproductive management.