0359 Changes in activity and milk components around onset of clinical mastitis. A. S. Griffith*, M. L. McGilliard, and C. S. Petersson-Wolfe, *Virginia Tech University, Blacksburg.*

The objectives of the current study were to identify early indicators of naturally-occurring clinical mastitis in the first 30 DIM using peripartum daily activity, postpartum milk components, and milk yield data. A total of 200 cows that consisted of 136 Holstein (60 primiparous, 76 multiparous), 59 Jersey (24 primiparous, 35 multiparous), and 5 Crossbred (5 multiparous) animals were followed from January 2013 through September 2013. Daily activity was collected from 21 d prepartum to 30 d postpartum for all animals with a behavioral monitoring system (Afi PedometerPlus, S.A.E. Afikim, Israel), which collected rest bouts, rest duration, rest time and step activity. Daily milk lactose % and fat:protein ratio were collected from 4 to 30 DIM for all animals, using an in-line milk analysis system (AfiLab, S.A.E. Afikim, Israel) and daily yield was collected from the milk meter. Mastitis was defined as visual changes in milk appearance (flakes, chunks, or color) in one or more quarters as detected by the milk harvesters at the time of milking. Controls were defined as any animal in the same group, parity (1 or $\geq$ 2), and breed on the same date as the diseased cow, that did not experience any disease within the first 30 DIM. Differences between diseased and controls from d -7 to d 7 relative to disease, were examined using PROC GLIMMIX in SAS (Cary, NC). Lactation number, day relative to disease, disease status, and their interactions were included in the model. Significance was determined at $P \leq$ 0.05. Animals that experienced mastitis ($n = 15$) showed more daily steps from d -5 to 0 and fewer daily rest bouts on d -1 and 0 relative to disease, compared to controls. Additionally, diseased cows showed reduced milk lactose % compared to controls from d -1 to 2 relative to disease and daily yield was decreased from d -2 to 1. Finally, no differences were found in daily rest time, rest duration or fat:protein ratio. This is the first study to show changes in activity and milk components before the onset of naturally-occurring clinical mastitis in early lactation. The identification of animals at risk for periparturient disease may allow producers to implement a proactive strategy for disease treatment, improve animal well-being and alleviate the economic losses associated with health problems during the transition period.

Key Words: mastitis, daily activity, milk components

0360 Predicting impending calving using automatically collected measures of activity and rumination in dairy cattle. M. R. Borchers*, A. E. Sterrett, B. A. Wadsworth, and J. M. Bewley, *University of Kentucky, Lexington.*

The objective of this study was to monitor behavioral changes in prepartum dairy cattle and predict impending calvings through the automated observation of activity and rumination. Data collection for 29 primiparous and 46 multiparous Holstein dairy cattle occurred from September 13, 2011 through May 16, 2013 at the University of Kentucky Coldstream Dairy. The HR Tag (SCR Engineers, Ltd., Israel) was used to automatically collect neck activity and rumination data in 2-hour increments. The IceQube (IceRobotics, Ltd., Scotland) collected hourly step number, hours lying, hours standing, lying bouts, and total motion data. Data collection occurred for 7 wk prepartum and retrospective data analysis was performed using SAS (Cary, NC). Data summed by day for each cow was included in the calculation of a 7-d backward moving average and standard deviation to establish each cow's baseline values. Least-squares means were calculated from moving averages using the MIXED procedure of SAS. Parameters exhibiting significant differences ($P < 0.05$; mean $\pm$ SE) on the day of calving (DAY^0) versus the day before (DAY^{-1}) included: hours lying (DAY^0: 10.15 $\pm$ 0.25 vs. DAY^{-1}: 10.50 $\pm$ 0.25), hours standing (DAY^0: 13.79 $\pm$ 0.25 vs. DAY^{-1}: 13.47 $\pm$ 0.25), lying bouts (DAY^0: 11.36 $\pm$ 0.38 vs. DAY^{-1}: 9.86 $\pm$ 0.38), and minutes ruminating (DAY^0: 319.29 $\pm$ 12.01 vs. DAY^{-1}: 336.86 $\pm$ 12.01). Neck activity, step number and total motion showed no significant differences between DAY^0 and DAY^{-1}. Z-scores were calculated using data summed by day for each cow, moving averages, and moving standard deviations. Deviations $\geq$ 1.5 from the mean dictated alert creation. The percent of cows ($n = 61$) showing an alert by parameter on DAY^0 was: lying bouts (75.4%), minutes ruminating (45.9%), step number (39.3%), total motion (39.3%), hours standing (32.8%), hours lying (31.1%), and neck activity (21.3%). In comparison, the percent of cows ($n = 57$) showing an alert by parameter on DAY^{-1} was: lying bouts (15.8%), minutes ruminating (15.8%), step number (17.5%), total motion (15.8%), hours standing (28.1%), hours lying (28.1%), and neck activity (12.3%). Changes in least-squares means and alerts relative to calving indicate that these measures may be useful in predicting impending calvings without adding new technologies or parameters, but further research is necessary.

Key Words: calving prediction, days before calving, activity and rumination