Prevention and control of mastitis continues to be one of the major challenges facing the dairy industry. Intramammary antibiotic (AB) infusion at dry-off is used to treat subclinical mastitis at dry-off and prevent clinical mastitis during the dry period. In addition, internal teat sealants (ITS) are used to prevent exposure to new infections during the dry period. A block randomized trial was completed between December 2016 and August 2018 on 8 California dairy herds. A total of 1,273 cows were block randomized to 1 of 4 treatments (None, AB, ITS, or both) over 2 seasons, summer and winter. Composite milk samples were collected at enrollment (dry-off) and within 14 d after calving for bacteriological culture. The objectives of this clinical trial were to compare the health outcomes between the treatment groups, specifically: 1) clinical mastitis and culling during the dry period and the first 150 d in milk (DIM) in the subsequent lactation, and 2) bacteriological cure and new infections in the first 150 DIM in the subsequent lactation. Logistic regression models showed no significant differences in the odds of clinical mastitis or culling between cows treated at dry-off with AB, ITS, or both compared with the controls (None). Cows treated with both AB and ITS had the highest odds of bacteriological cure (OR 3.05; \( P < 0.01 \)), followed by cows treated with AB (OR 2.38, \( P < 0.01 \)), followed by ITS (OR 2.0; \( P < 0.01 \)) in comparison to controls. Cows treated with AB and ITS at dry off had the lowest odds (OR = 0.45; \( P < 0.01 \)) of developing new infections after calving followed by cows that received internal teat sealants (OR = 0.51; \( P < 0.01 \)); however, cows that received only AB had numerically lower odds (OR = 0.70; \( P = 0.09 \)) in comparison to untreated cows. The most common bacteria isolated by culture at dry off, post-calving and at the first mastitis were Coagulase negative staphylococci, Streptococcus spp., Corynebacterium spp., Aerococcus spp., Californis and Lactococcus spp. Dry cow treatment with AB and/or ITS increased the bacteriological cure and reduce the new infections.

**Key Words:** dry cow therapy, mastitis, clinical trial

**387** Effect of treatment at dry-off with intramammary antibiotics, internal teat sealants, or both on the health of dairy cows. W. R. ElAshmawy*,1, D. Okello1, D. R. Williams1, R. J. Anderson*, P. Ros-sitto1, J. D. Champagne1, K. Tonooka2, K. Glenn1, B. Karle1, T. W. Lehnenbauer1, and S. S. Aly1,1, Veterinary Medicine Teaching and Research Center, School of Veterinary Medicine, University of California-Davis, Tulare, CA, 1Department of Internal Medicine and Infectious Diseases, Faculty of Veterinary Medicine, Cairo University, Giza, Egypt, 2Department of Population Health & Reproduction, School of Veterinary Medicine, University of California-Davis, Davis, CA, 4Animal Health Branch, California Department of Food Agriculture, Sacramento, CA, 5Cooperative Extension, Division of Agriculture and Natural Resources, University of California, Orland, CA.

It is well established that subclinical mastitis (SCM), characterized by somatic cell count (SCC) > 200,000 cell/mL, has a negative impact on productivity, reproductive performance, and survivability of cows from conventional dairy herds. However, information about the detrimental impacts of SCM in dairy cows from organic herds is scarce. Therefore, our objective was to evaluate how SCM diagnosed during the first month of lactation impacts milk production, fertility and culling of cows on organic farms. Data from 2 USDA-certified organic dairy herds located in Texas and New Mexico were extracted from the farms’ database software. A total of 2,716 cows that calved between June 2018 and May 2019 were included in the study. Cows with SCC > 200,000 cells/mL in the first month of lactation were considered as having SCM. Statistical analysis was performed using SAS 9.4 (SAS Institute Inc., Cary, NC). Repeated measured ANOVA models were used to assess the effect of SCM on monthly milk production and SCC linear scores. Cox proportional hazards models were used to evaluate the effect of SCM on the risk of pregnancy and culling. The variables lactation group (1, 2, and 3 or greater), herd, twin parturition, and stillbirth were offered to all models. The prevalence of SCM in the first month of lactation was 32.8%. Subclinical mastitis decreased the milk yield during the first 10 mo of lactation. The average milk yield for cows with SCM and healthy counterparts was 33.1 kg/d and 31.8 kg/d, respectively (\( P < 0.01 \)). Cows with SCM in the first month of lactation had elevated SCC throughout the entire lactation. The average SCC linear score was 4.2 and 2.6 for SCM and healthy cows. Risk of pregnancy was not impacted by SCM (\( P = 0.44 \)). Cows that had SCM in the first month of lactation were 1.82 times more likely to be culled or die than healthy cows (\( P < 0.01 \)). In conclusion, SCM in the first month of lactation impairs milk production, increases the risk of culling, but does not impact fertility of dairy cows under organic certified management.

**Key Words:** organic, subclinical mastitis, milk yield

**389** Pattern of behavioral, physiological, and performance parameters before and after clinical diagnosis of mastitis. M. M. Pérez*,1, E. M. Cabrera1, C. Rial1, D. V. Nydam2, and J. O. Giordano1, 1Department of Animal Science, Cornell University, Ithaca, NY, 2Department of Population Medicine and Diagnostic Sciences, Cornell University, Ithaca, NY.

The objective of this study was to compare the pattern of multiple behavioral, physiological, and performance parameters automatically collected by sensors in cows diagnosed with clinical mastitis (CM). Data from Holstein cows (n = 1,206) evaluated for CM by clinical examination at or after milking for up to 28 DIM were used. Sensor parameters used were: activity (ACT), resting (RET), rumination (RUM) and eating (EAT) behavior, reticulo-umen temperature (TEMP), milk production (MILK) and milk components (FAT, PROT, LACT), and milk conductivity (CON). Sensor data from d −7 to 7 after CM diagnosis was compared between cows with no evident signs of clinical disease (NCD n = 824), CM only (CMO; n = 52), and CM plus another disorder during the 15-d period (CM+ n = 29). Data were analyzed by ANOVA with repeated measurements with group, time, and their interaction and lactation number (1, 2, or 3+) as fixed effects. Cow within group was a random effect and the subject of repeated measures. Sensor data used for NCD cows was for the 7 d before and after the average DIM at mastitis diagnosis for cows in the CMO and CM+ group. MILK was reduced (\( P < 0.01 \)) after d −5 for CM+ and after d −2 for CMO compared with NCD, with the greatest difference on d 1 and 2. FAT and FAT-to-PROT ratio values differed (\( P < 0.01 \)) in the range of d −1 to 2 as they were greater for CMO and CM+ than for NCD. CON was greater (\( P < 0.01 \)) for CMO and CM+ than for NCD after d −3 and d −2, respectively with the greatest difference in d −1 and 2. RET was greater (\( P < 0.01 \)) for CMO than NCD after d 0. ACT was lesser (\( P < 0.01 \)) for CM+ than for CMO after d 0. RUM was lesser (\( P < 0.01 \)) for CMO and CM+ from d −5 to d 5 with the greatest difference on d 0, whereas EAT was lesser (\( P < 0.01 \)) for CMO and CM+ from d −2 to 7 d with the greatest difference on d 0 and 1. TEMP was greater (\( P < 0.01 \)) for CM+ than NCD on d −1 and 0. We conclude that cows with CM only and CM plus another disorder presented specific patterns of behavioral, physiological, and performance parameters that can be detected by sensors hence, these pattern changes might be used to predict the occurrence of cases of CM.

**Key Words:** sensor, mastitis, dairy cow

**390** Impact of dry-off management in robotic milking systems on milking behavior, milk yield, and somatic cell count. A. E. France*,1, S. Dufour2, D. F. Kelton1, H. W. Barkema1, D. Kurban2, and T. J. DeVries1, 1Department of Animal Biosciences, Guelph, ON, Canada, 2Faculté de
The objective of this study was to determine the effect of dry-off management of cows milked in automatic milking systems (AMS) on milk yield, milking behavior, and SCC. In 5 commercial dairy farms in Quebec, Canada, 341 cows were assigned to 1 of 4 treatments for 2-wk before dry off: 1) reduced milking (RM: 2x/d or if expected to yield 17 kg/milking; n = 95), 2) reduced feeding (RF: 0.75 kg AMS pellet/d for wk 1, 0.5 kg AMS pellet/d for wk 2; n = 98), 3) reduced both feeding and milking (RB: n = 73), and 4) a control (C: n = 75) group. Non-reduced milking allowed up to 6 milkings/d or as often as a cow was expected to yield 6 kg/milking. Non-reduced feeding allocated up to 2 kg/d of AMS pellet. From the AMS software, feed and milking behavior data were collected, as well as milk yield and SCC. Data on milk yield, milking frequency, and SCC were analyzed using mixed-effect linear regression models. The RB group had the lowest milk yield 3 d before dry-off, and was different from the C group (19.3 vs. 22.4 kg/d; SE = 1.08; P = 0.01). The RB group also differed from the C group in their reduction in total milk yield over the 2-wk treatment period (−4.9 vs. −1.8 kg; SE = 0.91; P = 0.02), indicating that this was the most efficient way to decrease milk yield before dry-off. Milking frequency was greater (SE = 0.09; P < 0.001) in the RF (2.25 ×/d) and C (2.65 ×/d) groups compared with the RM (1.60 ×/d) and RB (1.51 ×/d) groups. There was a difference (P < 0.001) in milking frequency between the RF and C groups, indicating that reducing feeding without altering milking frequency before dry-off may also decrease the motivation for cows to visit the AMS. There were no differences between groups (P > 0.24) for milking frequency or yield in the next lactation. SCC was not different (P > 0.35) between groups in the week before dry-off nor in the first month after calving. Overall, these data suggest that reducing both milking frequency and feed quantity in the AMS is the most efficient method to decrease milk yield before dry-off, without negatively influencing milking frequency or yield in the next lactation, as well as without affecting SCC.

Key Words: dry-off, robotic milking, udder health

391 Cow health and dairy farmer mental health in herds with robotic milking systems. M. T. M. King, R. D. Matson, and T. J. DeVries*, Department of Animal Biosciences, Guelph, ON, Canada.

The objective of this study was to survey dairy farmers using robotic milking systems to better understand their mental health and the potential connections to cow health. Of 76 farms in Ontario, Canada visited to survey management, cow health, and milk production, 34 farmers completed an online survey that included validated psychometric scales used to assess stress, anxiety, and depression. Thirty cows/farm (or 30% for herds > 100 cows) were scored for body condition (5-pt scale, 1 = thin to 5 = over-conditioned) and lameness (5-pt scale, 1 = sound to 5 = lame); cows with a BCS ≤ 2.5 and lameness score of ≥ 4 were defined as under-conditioned and severely lame, respectively. Univariable models were used to screen independent variables (as fixed effects) in mixed-effect linear regression models; variables with P < 0.25 were offered to multivariable models. At a farm level, the prevalence of severe lameness was correlated with average milk yield per cow, SCC, and the proportion under-conditioned cows; thus, only lameness prevalence was offered to multivariable models. Farmer stress was greater for females vs. males (P = 0.007), for those feeding manually vs. using an automated feeder (i.e., conveyer or automated delivery system; P = 0.01), and for those with a greater lameness prevalence (P = 0.02). Depression was greatest for those working alone on the farm (P = 0.02), those feeding manually (P = 0.03), and those with lesser average milk protein % (P = 0.003). Anxiety was greater for females vs. males (P < 0.001), and for those feeding manually (P = 0.005), working alone on the farm (P = 0.07), and with a greater lameness prevalence (P = 0.02) and lesser milk protein % (P = 0.07). Comparing our results to a similar survey of all commodity groups across Canada, dairy farmers using robotic milking systems may be experiencing less stress, anxiety, and depression than other farmers. The results highlight the potential benefits of automated milking and feeding systems and the difficulties associated with working alone. Farmer mental health was identified to be associated with milk yield, quality, and composition, in addition to cow health.

Key Words: automated milking, mental health, cow health