

Animal Behavior and Well-Being I

493 Development of a behavior-based screening tool for disease detection in preweaned group-housed dairy calves. Mary C. Cramer* and Amy L. Stanton, *University of Wisconsin- Madison, Madison, WI.*

Producers report bovine respiratory disease (BRD) and diarrhea as the 2 most common diseases in preweaned calves, both of which can affect calf performance and welfare. Group housing has the potential to improve calf welfare, but only if producers are able to detect disease. To reduce time evaluating individual calves, there is a need for a group level health-screening tool to identify potentially sick calves that require further examination. The objective of this study was to develop a screening tool using behavioral measures to detect disease in preweaned group-housed dairy calves. This cross-sectional study included the evaluation of preweaned group-housed calves ($n = 206$) on 4 farms in Wisconsin. Calves were scored for behaviors that were hypothesized to be indicative of illness: abnormal posture when lying or standing, isolation, lethargy, and the willingness to approach a stationary person (2 approach tests were performed and each was scored separately). Each behavior category was scored as normal (0 points) or abnormal (1 point) and then categories were summed to obtain a total behavior score for each calf. Following the behavior scoring, calves underwent an individual health assessment for BRD, diarrhea, and umbilical infections. Total behavior scores ranged from 0 (normal) to 5 (severely abnormal) and reflect the number of abnormal behaviors observed. The highest sensitivity and specificity of the behavior score for disease identification occurred at score cut points of 2 and 3. Therefore, scores of 2 or greater or scores of 3 or greater were considered a positive test result for disease and were further examined. Outcomes of a positive or negative behavior score for cut points of 2 and 3 were analyzed using PROC LOGISTIC in SAS and all models were controlled for calf age and farm. A score of 2 or greater tended to be significant for the detection of diarrhea ($P = 0.05$), but was not significant for BRD ($P > 0.05$). At a cut point of 3 or greater, calves without BRD were 0.24 (95% CI: 0.10 to 0.59) times as likely to have a positive behavior score, compared with calves with BRD ($P < 0.01$). Utilizing a cut point of 3 or greater on this behavior-based screening tool may be useful to identify calves with BRD.

Key Words: behavior, BRD, calves

494 Milk replacer plane of nutrition influences calf nutritive and non-nutritive oral behaviors. Lindsey E. Hulbert¹, Sophia C. Trombetta*¹, Kate P. Sharon², and Michael A. Ballou², ¹*Department of Animal Sciences and Industry, Kansas State University, Manhattan, KS,* ²*Department of Animal and Food Science, Texas Tech University, Lubbock, TX.*

The objectives of the study were to (1) determine if milk replacer (MR) plane of nutrition (PN) influences Holstein bull-calf daily duration of non-nutritive sucking (NNS) as well as daily calf starter (CS) and water intake from ages 6–64 d and, (2) determine if automated NNS measures can be used as an additional measure to CS intake to determine if calves are ready for weaning. At age 1 d, calves were randomly assigned to MR treatments of either High (HPN; $n = 18$; 20:28 DM fat:protein; 830g and 1080 g DM/d from ages 1 to 10 and 11 to 51 d, respectively) or Low (LPN; $n = 15$; 20:20 fat:protein; 445 g DM/d ages 1–51 d) PN. All calves were fed milk bottles twice daily at 0700 and 1600 h until step-down weaning. Weaning was initiated at age 51 d by removal of the PM-MR feeding and completed at age 57 d with the removal of the

AM-MR feeding. Water and CS were offered ad libitum and measured once daily. Daily-NNS was measured by event-loggers (1 Hz, HOB0 State Data Logger UX90–001M) that recorded when each calf manipulated a dummy-nipple. Repated data were analyzed using REML PROC MIXED procedure in SAS. Throughout the experiment, LPN-calves drank $1.5 \times$ more water than HPN-calves ($P < 0.05$). Prior to weaning, LPN-calves consumed more CS than HPN-calves ($P < 0.01$), except for ages 32–41 d. During and after weaning the LPN calves consumed over 18% more CS than HPN ($P < 0.01$). After weaning was completed, HPN-calves doubled CS intake compared with pre-weaning ($P < 0.05$). The LPN-calves performed more daily NNS at ages 13–17 d ($P < 0.01$). Around weaning, HPN-calves tripled NNS from pre-weaning measures ($P < 0.05$), while LPN calves nearly stopped their NNS behaviors ($P < 0.01$). These results indicate that PN influences nutritive and non-nutritive oral behaviors. Calves fed LPN are not motivated to perform NNS once one MR feeding is removed from their diet. In contrast, weaning-initiation increases NNS in HPN-calves, but full-removal of MR stimulates CS intake in HPN-calves. In addition, HPN-calves may not acclimate as easily as LPN-calves to step-down weaning; therefore, alternate weaning strategies for HPN calves may need to be considered and tested utilizing NNS measures.

Key Words: behavior, calf, nutrition

495 Evaluation of pelleting a feed-through larvicide on dairy calf behavior and fly control. Randi Black*¹, Christa Kurman¹, David Paulsen², Rebecca Trout Fryxell², and Peter Krawczel¹, ¹*Department of Animal Science, University of Tennessee, Knoxville, TN,* ²*Department of Entomology and Plant Pathology, University of Tennessee, Knoxville, TN.*

Dipteran pests affect dairy calves through rapid transmission of pathogens and reduction in calf well-being. A feed-through larvicide may effectively manage fly pressure and improve well-being. The objective of this study was to determine the effect of pelleting a feed through larvicide on calf lying behavior. Holstein dairy calves ($n = 12$) were divided into 4 pens and assigned to one of 2 treatment sequences: control (CON)-washout (WAS)-larvicide (LAR) ($n = 6$) or LAR-WAS-CON ($n = 6$). CON and LAR lasted 4 d and WAS lasted 10 d. The control pellet was fed during CON and WAS and the experimental pellet was fed during LAR. Dataloggers recorded lying bouts and posture at 1-min intervals from d 0 to d 24. Fecal samples, collected on d 2, 4, 11, 20, and 14, were seeded with house ($n = 25$), stable ($n = 25$), face ($n = 25$), and horn fly eggs ($n = 25$) to assessed daily emergence of pupae and adults. Data were analyzed using PROC GLM of SAS to determine the effect of treatment period, sequence, and treatment period \times sequence interaction. No effects on lying bouts were evident ($P \geq 0.26$). Calves laid down longer during CON (17.1 ± 0.2 h/d) and LAR (17.2 ± 0.2 h/d) compared with WAS (14.4 ± 0.1 h/d; $P < 0.0001$). Further, calves laid down less frequently during WAS (11.6 ± 0.2 bouts/d) compared with CON (16.5 ± 0.4 bouts/d) and LAR (16.0 ± 0.4 bouts/d; $P < 0.0001$). Calves on the LAR-WAS-CON sequence had a tendency to stand longer (8.0 ± 0.2 h/d) than CON-WAS-LAR sequence calves (7.5 ± 0.2 h/d; $P = 0.08$). Fewer pupae emerged during the WAS period of the LAR-WAS-CON sequence (5.8 ± 1.5 pupae) compared with CON in CON-WAS-LAR (18.0 ± 1.0 pupae) and LAR-WAS-CON (19.1 ± 1.0 pupae), LAR in CON-WAS-LAR (18.8 ± 1.0 pupae) and LAR-WAS-CON (16.3 ± 1.0 pupae), and WAS in CON-WAS-LAR (13.7 ± 1.5 pupae; $P < 0.0001$). This indicates there may be a delayed response of larvicide. Further,

fewer adults emerged during the LAR period (1.6 ± 0.8 adults) compared with the CON period (7.9 ± 0.8 adults) of the LAR-WAS-CON sequence ($P < 0.01$). These data suggest a pelleted feed through larvicide may be an effective fly management option for producers without negatively affecting calf behavior.

Key Words: dairy calf, larvicide, behavior

496 An outdoor method of housing dairy calves in groups using individual calf hutches. Lisa M. Wormsbecher^{*1}, Renée Bergeron¹, Derek B. Haley², Anne Marie B. de Passillé³, Jeff Rushen³, and Elsa Vasseur¹, ¹*Organic Dairy Research Centre, University of Guelph, Alfred Campus, Alfred, ON, Canada*, ²*Ontario Veterinary College, University of Guelph, Guelph, ON, Canada*, ³*UBC Dairy Education and Research Centre, University of British Columbia, Agassiz, BC, Canada*.

Housing dairy calves in groups allows natural social interactions between conspecifics. Many farms still house dairy calves individually and feed them milk by hand. Some dairy operations have implemented group-housing using an automated milk feeding system even if the initial set up is expensive. To evaluate the feasibility of using calf hutches in a novel, low input cost group-housing method, we compared individually- and pair-housed calves kept in hutches and examined differences in growth rate, activity level, and competition of paired calves at feeding. Individual calves were given a hutch with an outdoor area (total 6.87 m²); 2 hutches were placed side by side with a shared outdoor area for paired calves (6.87 m² total per calf). Eighteen Holstein heifer calves were purchased and arrived on farm between the ages of 5–12 d. Calves were assigned to treatments and balanced for age and weight within pairs and across treatments. Over 7 weeks, calves had free-access to milk (up to 16 L/day/calf), calf starter, water and hay. Activity loggers were used to record daily lying time and calves were weighed each week to monitor growth. To evaluate competition in pairs and use of space for all calves, behavioral observations were completed 1 d/wk (7 non-consecutive h/d) and included recording calf location within pen, and for paired calves: displacements at the nipple (indicative of competition between calves), cross sucking (sucking on conspecific), and social grooming (grooming/licking another calf). Over 7 weeks of milk feeding the average feed conversion was 0.10 ± 0.005 kg weight gain/kg milk intake (mean \pm SE) for paired and individual calves. Social interactions by paired calves did not change across weeks (Wilcoxon sign rank tests; $P > 0.1$): $5.5 \pm 1.62\%$ social grooming, $1.4 \pm 0.84\%$ cross sucking, and $6.5 \pm 3.60\%$ displacements at the nipple. Data for growth, resting time, and space usage are being analyzed while milk and competition data are undergoing further analysis. A 6-week winter replicate of this research is in progress to determine whether the housing method can be utilized in various climatic conditions.

Key Words: dairy, calf, housing

497 The use of single measurements to assess growth of dairy calves and the effect of management practices on calf BW variability. Guilherme B. Bond^{*1}, Daniel M. Weary², Marina A. G. von Keyserlingk², Lorraine Doepel¹, Karin Orsel¹, Herman W. Barkema¹, and Edmond A. Pajor¹, ¹*University of Calgary, Calgary, AB, Canada*, ²*University of British Columbia, Vancouver, BC, Canada*.

Bridging the gap between research methods and application on commercial farm settings is necessary to stimulate producers to use new management practices that promote better calf welfare. Our objectives were to evaluate the association between a single measurement of calf

BW and management practices and identify practices related to higher BW residuals. Farms ($n = 82$) were selected through convenience sampling, had at least 80 Holstein lactating cows and used DHI recording systems. Visits occurred once from June 2010 to August 2012 in AB and BC, Canada. Producers were interviewed about their pre-weaning calf management practices and heart girth was measured for all available calves from 0 to 8 weeks of age. The final database contained data from 865 calves from 57 farms in AB (567 calves) and 25 farms from BC (298 calves). Calf BW was regressed against age and the resulting line equation was $BW = 40.56 + 4.649 \times \text{Age (wk)}$. Calf BW residuals were calculated by subtracting the actual BW from the expected BW at each age. Individual animal BW residuals were averaged by farm to represent calf growth on each farm. Average farm BW residuals ranged from -16.5 kg to $+16.7$ kg. The association between management practices and calf BW residuals was tested at calf-level using mixed models in SAS 9.4. Management variables significant in a univariable model ($P < 0.20$) were included in the final multivariable model ($P < 0.05$). Feeding more than 5 L of milk per day through a teat was associated with higher BW. Conversely, calves fed less than 5 L of milk by bottle had the lowest BW when compared with the other feeding strategies. Feeding milk by bucket, regardless of the amount, was associated with lower BW. Calves introduced to water at an earlier age had higher BW than calves introduced to water later than 2 mo of age. Calves housed in groups had lower BW when compared with calves housed in individual pens; mixed housing (using 2 or more different types of housing) resulted in the lowest BW compared with other systems. The growth measurement used in this study was successful in describing differences of calf growth among farms. These differences were related to practices such as feeding more milk by teat and early introduction to water.

Key Words: welfare, feeding, water

498 Reflective calf hutch covers improve antibody response and decrease panting, but not gain, during hot conditions. Jade Haberman, Theodore Friend^{*}, and Thomas Hairgrove, *Texas A&M University, College Station, TX*.

Previous research found reflective hutch covers reduced hutch temperature during hot weather, but the biological significance is unknown. This study determined the effect of reflective covers on calves' immune response, body weight, and respiration rate. The study was conducted from June to August, on 2 farms: one near Stanfield, Arizona (10,000 cows) and one near Plainview, Texas (6,000 cows). Agri-Plastic hutches were used in Arizona and Calf-Tel in Texas. Covers were 3.0 mil (aluminized on the external side) white LDPE overlaying the top, sides, and back of the hutches; leaving the front exposed. At each farm, 5 covered and 5 uncovered (control) hutches were also fitted with temperature loggers that recorded internal hutch temperature every 30 min. Calves were given a commercial IBR vaccine at 21-d of age and antibody titer differences at 21 and 42 d determined immune response. Titers were determined using virus neutralization with logarithmic transformation to normalize data. Treatment effects were analyzed with ANOVA and LSD. Calves in covered hutches in AZ ($n = 50$) had a higher ($P < 0.05$) titer responses (25%) than control calves ($n = 54$). Respiration rates taken during sunny conditions at 16:00 at AZ were significantly lower (8 bpm, $P < 0.01$) for covered calves ($n = 43$) than controls ($n = 50$). Body weight was not significantly influenced by treatments at either farm ($P > 0.05$). Covered hutches were 3.03°C cooler than controls at the hottest time of the day at AZ ($P < 0.01$) and 0.7°C warmer ($P < 0.05$) during the coolest 2 h period at night. TX was much cooler than average with cloud cover and rain, and daily highs averaged 7.9°C lower than AZ over the study period, so the cover were not advantageous in

TX. In conclusion, the reflective covers were most effective during sunny and hot conditions, resulting in increased antibody response and decreased respiration rate.

Key Words: heat, stress, dairy

499 Lameness score, pain threshold, temperature and type of lesion of severely lame dairy cows before and after trimming.

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This study aimed to verify the effect of corrective trimming and the type of lesion on lameness score (LS), nociceptive pain threshold and temperature close to the lesion of lame cows. Six Jersey and 28 Holstein cows were used. The day before trimming (day -1), cows were gait scored using a 1-to-5 numerical rating system where 1 = perfect gait and 5 = severely lame. Cows showing LS of 4 or 5 were selected. On d 0 (trimming), cows were restrained in a tilt chute and before they were hoof trimmed, they were evaluated for pain threshold, temperature close to the lesion and type of hoof lesion, which were classified as dermatitis (digital and interdigital) or ulcers (sole and wall ulcers). Temperature close to the lesion was measured with a thermograph. Pain threshold was measured utilizing an algometer, applying a pressure stimulus at the regions close to the lesion of both rear legs, and observing the foot-lift response. Cows with dermatitis were given an antibiotic and a bandage, those with ulcers received glueing shoes and none received analgesic. After trimming, on d 6, cows were evaluated for LS and on d 7, cows were evaluated for pain threshold and temperature close to the lesion. Data were submitted to variance analysis according to a completely randomized design, considering in the model the effect of trimming, type of lesion and their interaction. Twenty-six cows had dermatitis, 8 cows had sole and wall ulcers. There was no interaction between type of lesion and trimming (Table 1). Trimming decreased LS and increased pain threshold but did not affect temperature close to the lesion. Cows with dermatitis showed lower pain threshold than those with ulcers. Type of lesion did not affect LS nor the temperature close to the affected region. Trimming improved cow's welfare.

Table 1 (Abstr. 499). Effect of trimming and type of lesion on lesion pain and temperature

Trait	Corrective trimming (T)			Type of hoof lesion (L)		
	Before	After	P > F	Dermatitis	Ulcers	P > F
Pain threshold (kgf)	7.0 ^a	9.3 ^b	<0.01	6.8 ^a	9.5 ^b	<0.01
Lameness score (1 - 5)	4.5 ^a	2.9 ^b	<0.01	3.5 ^a	3.9 ^a	NS
Temperature of affected region (°C)	29.6 ^a	29.8 ^a	NS	29.7 ^a	29.8 ^a	NS

Key Words: lameness, pain sensitivity, trimming

500 Assessment of calving personnel performance and stillbirth in dairy herds.

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It is common to observe large between- and within-herd variation in calving personnel performance (CPP) and turnover (TO). The objectives were to assess (1) the association of self-reported conflicts (e.g., lack of communication) on knowledge, skills, and performance of personnel; and (2) the association of CPP and TO on stillbirth and economics. A total of 70 personnel (18 dairy herds and approximately 18,100 cows) who participated in a 2 yr calving training program designed to improve calving management practices and reduce stillbirth were assessed. The educational content was delivered through oral presentation with group discussion and demonstration with supervised practice (skills). Pre- and post-tests of knowledge were used to assess knowledge gain. Participants evaluated the program and provided qualitative feedback about their working environment. Data were analyzed using GLIMMIX. Unresolved conflicts was significantly associated ($P < 0.05$) with personnel performance (determined by proportion of stillbirth) regardless of any differences in knowledge and skills. For the economic simulation, CPP (determined by compliance with calving protocol) was set to either 85% or 95%. Calf loss (stillbirth) was set at 1 preventable death due to late or no intervention at calving, assuming 18% of births need assistance. The overall risk performance percentage (RP) was estimated taking into account the CCP and TO. Costs were set at \$280/head for calf loss, \$1,000 for herd audit, and \$1,000 for training (4 sessions/yr). For a 2,000-cow herd, calf losses were higher (\$43,490 or \$21 per cow/yr) for RP 85% with 30% TO (166 calves lost/yr) compared with RP 95% with 5% TO (19 calves lost/yr). The return on investment (ROI) for high performance teams (RP 95% and TO 5%) was \$21 for every \$1 invested (herd audit and training). The estimated ROI assumes that facilities are adequate, participants are willing to learn and apply newly learned concepts, and the herd audit correctly identifies and addresses the needs with the appropriate training program. Unresolved conflicts (interpersonal issues) within herd are associated with both TO and CPP, which in turns compromise the welfare of cows and calves around parturition.

Key Words: dairy personnel, stillbirth, welfare

501 Do improvements in housing and management voluntarily applied by producers following a cow comfort assessment reduce cow injuries in tie-stall dairies?

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Cow welfare is an increasing concern for consumers. In Canada new standards on the care and handling of dairy cattle have been established and are currently being enforced. Injuries to hocks, knees, and neck are common in dairy cows and are accepted as being painful and a welfare concern. The objective if this study was to evaluate how voluntary improvements applied by producers in housing and management following a cow comfort assessment with recommendations would lead to improvements in cow welfare in tie-stall farms. The 4 most reported modification made to the tie-stall were: adding new rubber mats, adding or adjusting the brisket board, pushing up and/or out the tie-rail, and/or increasing the chain length. Hock and knee injuries were scored on a scale of 0-3 were scores 2 (swelling 1 - 2.5 cm and/or a lesion) and 3 (swelling >2.5 cm) represent major injuries. Neck injuries were scored on a scale of 0-2 were 2 represents swelling and/or lesions. Forty cows/farm from a total of 19 farms (2 groups: 10 that applied modifications,

9 that did not) visited in the summer were scored during 2 assessments (2011 and 2014). Kruskal-Wallis test was used to compare, between farm groups, the difference in prevalence of injuries between both assessments. Both groups of producers who reported to have made modifications and those that did not had reduced prevalence of major hock injuries by 23.8 and 21.4% (SEM 3.14), major knee injuries by 27.0 and 25.3% (SEM 3.89) and major neck injuries by 32.9 and 34.8% (SEM 4.56) respectively. There were no differences observed in improvement of injury prevalence between both groups of producers (hock: $X^2 = 0.3$, $P < 0.1$; knee: $X^2 = 0.2$, $P < 0.1$; neck: $X^2 = 0.0$, $P < 0.1$). Between the time producers received results of the assessment of their farm, and the new assessment, the level of cow injury decreased indicating that when equipped with knowledge, producers took action to improve cow comfort. Besides the ones reported, producers may have applied other modifications in cow housing or management that could explain the reduction in cow injuries between both assessments.

502 Social dominance affects body growth, follicle development, and age at puberty in dairy heifers. Carolina Fiol*^{1,2}, Annie dos Santos^{1,2}, Augusto Lacava^{1,2}, Ana Maverino^{1,2}, Mariana Carriquiry³, and Rodolfo Ungerfeld², ¹*Departamento de Bovinos, Facultad de Veterinaria, Montevideo, Uruguay*, ²*Departamento de Fisiología, Facultad de Veterinaria, Montevideo, Uruguay*, ³*Departamento de Producción Animal y Pasturas, Facultad de Agronomía, Montevideo, Uruguay*.

The aim of our study was to determine the effects of social dominance in dairy heifers during the prepubertal period on body growth, follicle development and age of onset of cyclic activity. Sixteen Holstein dairy heifers (8.2 ± 0.3 mo-old, 208.5 ± 13.9 kg BW) were homogeneously allocated according to age and BW to 8 dyads. Each dyad was housed in a different pen separated by electrical fences, had access to only one feeder and received a total mixed ration on a 5% restriction of their potential total dry matter intake to promote competition between heifers. Social dominance (dominant-DH, subordinate-SH) was determined every 30 d in each dyad during the 120 d of the experiment. Heifers were weighed every 20 d, and the number of follicles, the maximum follicle diameter (MFD) and presence of corpus luteum (CL) were determined every 7 d by transrectal ultrasound. Puberty onset was defined as the first day in which a CL—confirmed in the following observation—was recorded. Body weight and follicular parameters were analyzed with an ANOVA for repeated measures, while age at puberty was compared with a paired *t*-test. At the end of the experiment, DH were heavier than SH heifers (312.4 ± 2.5 vs. 304.0 ± 2.5 kg for DH and SH respectively, $P = 0.006$). In addition, DH reached puberty earlier than SH (318.0 ± 17.5 vs. 330.0 ± 23.3 d, for DH and SH, respectively; $P < 0.05$), and presented greater MFD from d 53 until the end of the experiment (10.0 ± 0.5 vs. 8.3 ± 0.5 mm, DH and SH heifers; $P = 0.04$). There was an interaction between social dominance and day of the study for total number of follicles: SH had more follicles than DH heifers on d 70 (4.8 ± 1.1 vs. 8.6 ± 1.1 , DH

and SH, $P < 0.01$), 79 (4.3 ± 1.1 vs. 7.7 ± 1.1 , DH and SH, $P < 0.01$) and 86 (4.2 ± 1.1 vs. 6.8 ± 1.1 , DH and SH, $P = 0.04$). No differences were found on the number of follicles >6 mm between groups (1.7 ± 0.3 vs. 2.0 ± 0.3 , DH and SH, respectively; $P > 0.05$). In conclusion, with a slight restriction of food availability, dominant heifers presented greater body growth and reproductive development than subordinate ones. Financial support: CSIC, Uruguay.

Key Words: dominance, replacement heifer, puberty

503 Association between social ranking and health of transition dairy cows. Karen M. Lobeck-Luchterhand*, Paula R. B. Silva, Ricardo C. Chebel, and Marcia I. Endres, *University of Minnesota, St. Paul, MN*.

The objective of this study was to determine whether social ranking was associated with health of transition dairy cows. A total of 953 Jersey cows were used in the analysis. Cows were examined on DIM 1, 4, 7, 10, and 13 for the diagnosis of retained fetal membranes (RP) and metritis. Metritis was defined as cows with watery, pink or brown, and fetid uterine discharge; acute metritis included cows that had a fever ($>39.5^\circ\text{C}$). Cows were classified with subclinical ketosis when BHBA concentration was ≥ 1200 $\mu\text{mol/L}$. Cows were observed once daily for displacement of abomasum (DA) and thrice daily for mastitis. Displacements from the feedbunk were measured continuously for 3 h after fresh feed delivery 4 d/wk during the 4 wk before calving for determination of social rank. A displacement index (DI) was calculated for each cow as the number of displacements as actor (cow initiated the displacement) divided by total displacements as actor or reactor (cow received the displacement). Displacement index was used on a continuous scale (method 1) and also categorized into social rankings (method 2); cows with a DI <0.4 were considered low-ranking, 0.4 to 0.6 were considered middle-ranking, and >0.6 were considered high-ranking. Additionally, the top and bottom 10th percentile for DI were selected to examine cows on the extreme ends of DI (method 3). Cows were categorized into bottom (DI <0.19), middle (0.19–0.71), and top 10th percentile (DI >0.71). Proc Logistics in SAS was used to investigate the association between social ranking (defined by each of the 3 methods above) and health. Displacement index was associated with RP (AOR = 1.02, 95% CI 1.00–1.03), metritis (0.99, 0.97–1.00) and incidence of mastitis up to 60 DIM (0.99, 0.97–1.00). High-ranking cows were 2.0 times (1.08–3.70) more likely to have RP than low-ranking cows with no differences between low- and middle-ranking cows. The bottom 10th percentile DI cows were 4.7 times (1.6–13.4) more likely to have a case of metritis than the top 10th percentile ranking cows. A cow's ability to displace another cow from the feedbunk during the prepartum period as a determinant of her social rank was not very consistent in predicting the odds of having a transition health disorder.

Key Words: social rank, transition cow, displacement index