

Wednesday, July 18, 2012

POSTER PRESENTATIONS

Animal Behavior and Well-Being: Behavior Emphasis

W1 Ruminal fermentation and behavior in Simmental heifers fed TMR with non-forage fiber sources in feedlots. S. P. Iruira,* J. L. Ruiz de la Torre, M. Rodríguez-Prado, X. Manteca, S. Calsamiglia, and A. Ferret, *Universitat Autònoma Barcelona, Bellaterra, Spain.*

The objective of this experiment was to determine the effects of non forage fiber sources on rumen fermentation and behavior of heifers fed TMR. Eight rumen cannulated Simmental heifers (initial BW 313 ± 13.2 kg) were randomly assigned to 1 of 4 treatments in a 4 × 4 double Latin Square design. The experiment was performed in 4 28-d periods. Treatments were barley straw (BS), soybean hulls (SH), beet pulp in pellets (BP) and whole cottonseed (WCS). Fiber ingredients were incorporated at 10, 16, 17 and 17% (DM basis) in BS, WCS, SH and BP, respectively. Diets were isoenergetic and isonitrogenous and were offered ad-libitum as TMR. Each heifer was individually housed in a roofed pen. Feed offered and refusal samples of each heifer were collected over 7 d in the last week of each experimental period to determine DM intake, chemical composition and particle size. Particle size separation was performed using the Penn State Particle Separator. On d 28 of each period, rumen samples were taken immediately before feeding and at 4, 8, 12, 16, and 24 h after feeding. Behavior was video-recorded for 24-h on d 2 and d 6 of each experimental period. NDF intake and ruminal pH were statistically analyzed using the MIXED procedure and behavior activity using the GLIMMIX procedure, both in SAS. NDF intake was higher in WCS than in BS (1.4 vs 1.3 kg/d; $P = 0.001$). Proportions of offered particles that were greater than 8 mm were 15.3, 6.1, 23.0 and 36.9% for BS, SH, WCS and BP, respectively. Average rumen pH was 5.87 in SH and 6.32, on average, in BS and BP ($P = 0.006$), but there were no differences between SH and WCS (6.20, on average). Time spent chewing was higher ($P = 0.001$) in BS and WCS (355 min/d, on average) than in SH and BP (252 min/d, on average). Time spent doing tongue-rolling in BP (16.8 min/d) tended to be higher than in the other 3 treatments (3.4 min/d, on average; $P = 0.069$) and no differences were found for licking or biting the fixtures. In conclusion, SH affected ruminal fermentation and BP tended to increase stereotypies when used as fiber sources in feedlot diets.

Key Words: cattle behavior, non-forage fiber, ruminal pH

W2 Foraging behavior of beef cows grazing native grassland: Effect of herbage allowance on temporal and spatial grazing patterns. S. Scarlato*¹, M. Carriquiry¹, M. Do Carmo¹, A. Faber¹, C. Genro³, E. Laca², and P. Soca¹, ¹Unviuersidad de la República, Paysandu Uruguay, ²University of California, Davis, ³Embrapa, Bage, Bage, RS, Brazil.

A 2-year study was conducted on a native grassland located in South America, to quantify grazing and ruminating times and patterns of spatial use in beef cows grazing at 2 herbage allowances (HA; 4 and 2.5 kg DM kg⁻¹ BW, for high and low, respectively) in a completely randomized block design (Block 1: Hereford and Angus purebred cows and Block 2: their F1 crossbred cows). Sixteen cows ($n = 4$ for HA and block) were assigned to 4 plots, remaining there in a continuous grazing system. The Put-and-take method was used monthly to adjust HA. Grazing and ruminating times were recorded over 24-h period using IGER recorders

for 3 consecutive days. Location (bottom, toe slope and shoulder slope zones) of cows within the plot during grazing activity was recorded by direct observation during daylight hours, and a relative preference index (RPI) was used to quantify preference for each zone. Recording periods were: spring 2007, 2008, and 2009, autumn 2008, and winter 2008 and 2009. Mean daily grazing and ruminating times were 738 ± 27 and 453 ± 26 min, respectively. Grazing activity was largely diurnal with 2 main sessions, one in the morning and another in the afternoon. Daily grazing time was greater ($P \leq 0.047$) for low than high HA cows in spring and autumn, which could indicate a compensatory mechanism for reduced HA but also for the less forage mass and height. Daily ruminating time decreased ($P \leq 0.044$) for low than high HA cows in spring, autumn and winter, suggesting a reduced DM intake, and showing constraints to compensate for limitations imposed by pasture in low HA. In general, the RPI for plot zones were not affected by HA ($P > 0.05$) but were affected by session ($P \leq 0.005$). During the afternoon grazing session, cows grazed in the shoulder slope zone ($P \leq 0.002$), with greater forage mass availability, while during morning grazing session, the bottom zone, close to the water source, was preferred ($P \leq 0.005$). This spatio-temporal behavior pattern may indicate an attempt to maximize intake before dusk, through increasing intake rate, minimizing the risk of predation. Quantifying spatio-temporal behavior of grazing ruminants in heterogeneous environments may help to improve livestock systems by integrating behavioral principles and processes into management practices.

Key Words: beef cow, grazing behavior, native pasture

W3 Feeding behavior of grazing buffalo calves fed different types of supplement in tropical conditions. R. M. Patiño,* L. G. Althahona, and L. M. Botero, *University of Sucre, Sincelejo, Colombia.*

The objective of this study was to evaluate the effect of different types of supplementation on feeding behavior of buffalo calves grazing in tropical conditions. Thirty Murrah calves, with average initial BW of 65 ± 1.97 kg, were assigned to 3 treatments, in a completely randomized design. One group received mineral supplementation, another group mineral and concentrate (0.5% BW) supplementation, and the third group remained as control, without supplementation. The animals grazed a pasture of Canutillo grass (*Hymenachne amplexicaulis*). After the adaptation period, animals were individually identified and their feeding behavior (idling, ruminating and grazing) was observed using visual method from 0800 to 1700 h, every 5 min, during 12 d, in a period of 60 d. Watering, consuming supplement and suckling times were measured using stopwatch. The animals were weighted every 15 d. The daily time spent in each behavior was analyzed considering the effect of the type of supplement (Table 1). The animals supplemented with mineral mixture and concentrate had a greater ($P < 0.05$) average of daily gain (0.547 kg) compared with mineral mixture treatment (0.388 kg) and the control group (0.320 kg). Drinking water time was not affected ($P > 0.05$) by the type of supplementation. The other activities were affected ($P < 0.05$). The animals supplemented with mineral mixture and concentrate spent more time ($P < 0.005$) to feed intake (grazing, suckling and consuming mineral mixture), that explained the best weight gain.

Table 1. Means of behavior (min/d) of buffalo calves under grazing and supplementation

Behavior	Nonsupplement	Mineral mixture and concentrate		SEM	P-value
		Mineral mixture	concentrate		
Grazing	299.3 ^a	336.3 ^b	356.0 ^b	5.656	<0.0001
Ruminating	312.8 ^a	261.8 ^a	253.8 ^b	8.286	0.005
Idling	640.3 ^{ab}	663.5 ^a	597.5 ^b	9.749	0.017
Suckling	7.0 ^a	3.5 ^a	15.3 ^b	1.345	0.001
Watering	6.3 ^a	3.5 ^a	7.3 ^a	0.784	0.129
Consuming mineral mixture		8.3	13.8	1.005	<0.0001

^{a,b}Means within a row followed by the same letter do not differ ($P > 0.05$) by Tukey test.

Key Words: behavior, buffalo calves, supplementation

W4 Effects of housing systems on behavioral responses of newborn Holstein calves. S. V. Matarazzo^{*1}, T. T. Fonseca¹, J. R. P. Arcaro², F. P. Campos², and S. A. de A. Fernandes³, ¹Universidade Estadual de Santa Cruz, UESC, Ilhéus, BA, Brazil, ²Instituto de Zootecnia de Nova Odessa, Nova Odessa, SP, Brazil, ³Universidade Estadual do Sudoeste da Bahia, Itapetinga, BA, Brazil.

The objective of this research was to evaluate the effects of housing systems on behavioral responses of newborn Holstein calves. The experiment was carried out from October to December 2006. Twenty female Holstein calves, 1-mo old and 46.2 ± 7.0 kg of body weight were randomly assigned to the treatment groups. Treatments were: individual shelter with 0.9 m wide, 1.2 m tall and 1.1 m long covered with recycled tiles maintained in pasture or individual hutch with located at 0.5 m above the floor with 0.9 m wide, 0.9 m and 1.1 m long maintained inside the barn. Calves received 4 L of milk a day, divided into 2 meals (8am and 3pm). Shelters were provided with individual enclosures for provision of concentrated and hay, which were offered ad libitum. The behavioral patterns activities (standing or lying down, rumination, resting, drinking, eating) were evaluated once a week from 8:00am to 8:00pm. Time spent standing up was higher (41%) in calves of individual shelter in relation to individual hutch (22%). Due to space limitation, animals probably chose to spend more time laying down (78%) for overcoming the uncomfortable situation and even to avoid traumas and other physical damages. On the other hand, animals kept in pasture were tightened to a chain, which allowed them to move around, either searching for shadow, exploratory behavior or grazing. There was no difference among calves from the different treatments in terms of time spent in rumination (23%), eating (8%) or drinking (3%). Resting time of calves in individual cage was higher (51%) than those of individual shelter (43%). Probably, the reason this time lasted longer for animals inside barns was because space and environmental restriction. Once time consumed with other activities is concerned, this was more intense (24%) for animals in individual shelters in pasture than for animals in hutches (14%). These activities were related to elimination activities, exploratory behavior, such as grazing around the shelter, which could only be observed for the last group of animals, besides stereotypical behaviors, such as biting, grabbing, hit the head, typical of animals in hutches.

Key Words: newborn, welfare, housing systems

W5 A preliminary study on the behavior of rodeo animals just prior to bucking events. E. A. Pajor^{*1}, T. Grandin², G. B. Bond¹, and C. Goldhawk¹, ¹University of Calgary, Calgary, Alberta, Canada, ²Colorado State University, Fort Collins.

Animals are used in numerous types of competitions. Many animal owners describe their animals as enjoying and anticipating these competitions. Despite these assurances, many criticize such animal use and claim that animals experience fear and mistreatment. In fact, there is very little empirical evidence to support either claim. One of the most criticized competitive events is rodeo. The purpose of this preliminary study was to describe the behavior of animals before bucking events at a rodeo. Direct observations were carried out by 5 trained observers at a national rodeo between July 11 and July 17, 2011. Animals were observed over 3 bucking events, bareback (n = 48 horses), saddle bronc (n = 57 horses), and bull riding (n = 48 bulls). Behaviors quantified were those associated with frustration and arousal (eye white, tail swishing, defecation) and escape behaviors (kick, paw at ground, move back and forth in chute). The period immediately before performance was divided into 3 separate time periods, loading the chute, tacking up, and mounting the animal. Only descriptive results are presented. Bareback horses and saddle bronc horses responded in a similar fashion and are grouped as horses. Horses tended to kick more than bulls (45% compared with 15%), while bulls tended to show more eye white than horses (45% vs. 40%). Horses performed more behaviors associated with arousal and escape while being loaded in the chute and during tacking up than when being mounted, 45% vs. 20% of the animals. Bulls were more aroused when being mounted than when loading (40% vs. 15%). Mounting animals involves not just the cowboy but numerous individuals in close proximity to the bull. It is not clear if animals are responding to the upcoming performance or the presence of large groups of people to which they are unaccustomed. This preliminary study suggests that although some animals were aroused and demonstrated escape behaviors, the majority of animals were calm and showed little arousal before leaving the chutes. Additional results will be presented at the meeting. This study is one of the first to describe the behavior of rodeo animals before the event.

Key Words: behavior, welfare, rodeo

W6 Determining the effects of castration with or without analgesia on growth performance, hematology, and behavior in neonatal beef cattle. A. C. Brown^{*1}, J. G. Powell¹, M. S. Gadberry², E. B. Kegley¹, J. T. Richeson³, J. L. Reynolds¹, and Y. V. Thaxton¹, ¹University of Arkansas Division of Agriculture, Fayetteville, ²University of Arkansas Division of Agriculture, Little Rock, ³West Texas A&M University, Canyon.

Angus-cross bull calves (n = 61) were weighed within 72 h of birth and assigned randomly to 1 of 3 treatments. Treatments were surgical castration, oral administration of meloxicam (1 mg/kg of BW) followed by surgical castration, or bulls remained intact (control). Subsets of 7 calves/treatment for castrates and 15 calves that remained intact were selected randomly and calf standing and lying activity was monitored by recording x and y-axis positions of a datalogging accelerometer attached to a leg for 7 d, in addition blood was collected on d 0, 1, 3, and 7. Calves were weighed every 28 d through d 112. Body weight did not differ between treatments ($P \geq 0.74$). Castrated calves receiving meloxicam tended ($P = 0.06$) to have greater % neutrophils and lower % lymphocytes on d 7 compared with castrates that had not received meloxicam (treatment \times day, $P < 0.02$). Hematocrit was greater ($P = 0.02$) in bulls on d 1 than in calves castrated without analgesic (treatment \times day, $P = 0.03$). The XY plots from accelerometers revealed 3 distinct clusters of data and cluster analysis within calf was used to categorize

observations into 3 clusters. Clusters (C) were determined to represent lying flat on side (C1), standing (C2) and lying (C3). Proportion of time expressed in C1, C2, and C3 was 0.36, 0.23, and 0.41, respectively. Proportion of daily activity expressed as C1 differed among treatments over time ($P = 0.05$); however, test of simple effects by day indicated no treatment differences on most days with the exception of d 5 where castration at birth with analgesia differed from castration without analgesia and non-castrated calves ($P < 0.01$). Proportion of time expressed as C3 was 0.38, 0.40, and 0.42 (SE 0.01) for castrated with analgesia, castrated without analgesia, and non-castrated, respectively; and differed for castrated compared with non-castrated ($P < 0.01$) and tended to differ for castrated calves given analgesia vs. those without analgesia ($P = 0.08$). Over the 7 d period following neonatal castration, use of pain control at the time of surgery had minimal effects on time spent standing and lying.

Key Words: castration, meloxicam, analgesia

W7 Pain and pessimism: Dairy calves show negative bias in judgment tasks following hot-iron disbudding. H. W. Neave,* M. A. G. von Keyserlingk, and D. M. Weary, *University of British Columbia, Vancouver, BC, Canada.*

Cognitive bias tasks involve interpretation of ambiguous stimuli. Depressed or anxious humans are known to judge ambiguous events negatively, and recent work on animals suggests that judgment bias can also provide a method of assessing emotions in non-human animals. No previous work has applied cognitive bias testing in cattle, and none has used judgment bias as a method of pain assessment. We assessed cognitive bias in dairy calves before and after hot-iron disbudding. Previous work has shown that calves experience pain for at least 24 h after this procedure. Holstein dairy calves ($n = 8$) were trained using a go/no-go task to expect positive (a milk reward) or negative (a time-out with no opportunity to access milk) outcomes following nose contact with a video screen that was either white or red; calves were alternatively assigned white or red as the positive training stimulus, and the opposite color as the negative training stimulus. Once calves had learned to discriminate between these 2 training stimuli (at least 90% correct over 3 consecutive training sessions), they were tested with unreinforced probes (screen colors at 25%, 50%, and 75% red) introduced randomly within training sessions. Probes were presented in sessions 1 d before and 1 d after disbudding. Calves approached the ambiguous probe screens less frequently after disbudding (78.1 ± 9.8 , 31.3 ± 11.8 , $2.5 \pm 2.5\%$ for the probe most similar to the positive screen, the mid-way probe, and the probe most similar to the negative screen, respectively) compared with before disbudding (84.6 ± 6.1 , 48.7 ± 9.9 , $18.5 \pm 4.4\%$), a difference that was most pronounced for the probe closest to the negative screen. These results illustrate that calves experiencing pain during the hours after hot-iron disbudding interpret ambiguous stimuli negatively compared with before disbudding. This “pessimistic” bias supports the use of a cognitive bias task as a measure of emotional state, including pain, in dairy calves.

Key Words: animal welfare, cognitive bias, animal emotion

W8 The effect of previous experience on the adaptation to headlocks by Holstein dairy cows. P. D. Krawczel* and J. M. Hale, *Department of Animal Science, University of Tennessee, Knoxville.*

Moving dairy cows into new facilities requires an adaptation to novel environments. The objective of this study was to determine differences in behavior following the delivery of TMR between lactating cows with

or without previous experience using headlocks. Forty-four Holstein dairy cows, from 3 different facilities, were assigned to 4 pens ($n = 11$ per pen) within a new facility using headlocks as the only feed barrier. Two pens comprised naïve cows (originating from facilities using only post-and-rail feed barriers; parity = 1.0 ± 0.0 ; body weight = 525.2 ± 13.5 kg; DIM = 234 ± 8 ; milk production = 25.8 ± 0.2 kg per d) and 2 pens comprised of experienced cows (originating from a facility with only headlock feed barriers; parity = 1.4 ± 0.1 ; body weight = 661.2 ± 22.1 kg; DIM = 328 ± 11 ; milk production = 18.6 ± 0.2 kg per d). Their response was assessed from the mean percentage feeding, lying, standing in the feed alley, or other using 10-min scan samples collected via direct observation. Data were collected during 2 h after the morning and afternoon delivery of feed for 7 d. Data were log-transformed (back transformed means reported) due to lack of normality and analyzed with the mixed procedure of SAS using repeated measures. More naïve cows engaged in feeding ($47.3 \pm 1.0\%$) than experienced cows ($29.4 \pm 1.0\%$; $P < 0.001$). However, a greater percentage of experienced cows engaged were lying (48.3 ± 1.0) and standing in the alley ($15.4 \pm 1.0\%$) relative to the naïve cows (lying = $20.9 \pm 1.0\%$ ($P < 0.001$) and standing = $13.7 \pm 1.0\%$ ($P = 0.02$)). Experience level had no effect on other behavior ($P = 0.71$). The initial hypothesis, previous experience would benefit cows (indicated by a greater percentage of cows feeding and a lower percentage standing in the feed alley following the delivery of TMR), was rejected. Experienced cows and naïve cows behaved differently following introduction to headlocks, but there was no indication of a benefit from previous experience. This suggests other factors may be more important during adaptation to novel environments.

Key Words: dairy cow, behavior, adaptation

W9 Lying behavior of lactating dairy cows is influenced by lameness especially around feeding time. C. Yunta*¹, I. Guasch², and A. Bach^{1,3}, ¹*Department of Ruminant Production, IRTA, Caldes de Montbui, Barcelona, Spain,* ²*La Pirenaica, La Seu d'Urgell, Lleida, Spain,* ³*ICREA, Barcelona, Spain.*

Lameness is considered one of the most common welfare and productive problem in dairy cattle. The objective of this study was to evaluate differences in lying behavior between lame and non-lame lactating cows under commercial conditions. Data were collected from 10 different free-stall commercial herds, which were feeding exactly the same ration once daily. All lactating cows were scored for lameness according to a 1–5 locomotion scoring system. Only cows with a lameness score between 1 and 4 were considered in the study. In each herd between 10 and 15 lame cows (scored as 3 or 4) were chosen for the study and for each lame cow, a non-lame cow (scored as 1) with same parity number and similar DIM was chosen within each herd. Pendant data loggers were then placed in the hind leg of each cow during 10 d to record lying behavior at 1-min intervals. In addition, the time of feed delivery was recorded in each herd on a daily basis. Total daily lying time, daily number of lying bouts, lying bout duration, laterality (side of recumbence), and lying behavior around feed delivery were evaluated using a mixed-effects model that accounted for the fixed effects of lameness score, DIM, parity, and the interaction between parity and lameness score, plus the random effects of herd and cow. Total daily lying time (721 ± 24.2 min/d) tended ($P = 0.07$) to increase with DIM, but it was not affected by lameness or parity. Likewise, no differences were found in the number of lying bouts (9.6 ± 0.49 d⁻¹) or laterality ($47 \pm 2.6\%$ of time lying on the right side). However, the mean bout duration was longer ($P < 0.05$) in lame compared with non-lame cows (89.3 ± 3.89 vs. 80.7 ± 3.90 min, respectively). Interestingly, lame cows stood up 13 min later ($P < 0.05$) than non-lame cows relative to the time when the

ration was delivered. In addition, lame cows lied down 19 min earlier ($P < 0.05$) than non-lame ones after the feed was delivered, which implies that non-lame cows spent more time standing and probably eating than lame cows. It is concluded that lame cows have longer lying bouts than non-lame animals, and that lying behavior around feed delivery time may be an effective proxy to identify moderately lame cows.

Key Words: feeding time, lameness, lying behavior

W10 Effect of grouping calves post-weaning according to pre-grouping feed intake on eating behavior. C. M. Matuk^{*1}, M. Chahine¹, A. Bach^{2,3}, B. Ozer¹, M. E. de Haro Marti⁴, J. B. Glaze Jr.¹, T. Fife¹, and M. Nelson¹, ¹University of Idaho, Twin Falls, ²IRTA, Caldes de Montbui, Spain, ³ICREA, Barcelona, Spain, ⁴University of Idaho, Gooding.

The effect of grouping calves post-weaning according to pre-grouping feed intake on eating behavior was evaluated using 755 replacement Holstein calves raised on a large operation in southern Idaho. In 4 different periods, individual feed intake was recorded 4 times a week during the last 3 wk that calves were individually hutched (60 d of age). Calves were classified as high eaters (highest feeding level quartile) and low eaters (lowest feeding level quartile). When leaving the individual hutches in each period, calves were assigned to 6 treatments: 20 animals randomly chosen without considering their level of feed intake (CTRL), 20 calves within the highest quartile of feed intake during the 3 wk prior leaving the hutches (HH), 20 within the lowest quartile (LL), 10 from the highest and 10 from lowest feeding level (HL), 5 from the highest and 15 from lowest feeding level (HLL), and 15 from the highest and 5 from lowest feeding level (HHL). Thus, out of 755 tracked heifers, 480 were chosen to form the 20 groups (6 groups per period) that were studied. After grouping, calves received a TMR composed of 95% starter and 5% alfalfa. Pen eating behavior was video recorded twice a week after grouping for 4 wks. Heifers in the highest feeding quartile in the HL, HLL and HHL were differentiated from the lowest quartile in their groups with a red plastic collar and reflective tape. A total of 192 d of recordings were collected and analyzed. Heifers were recorded as eating after 5 s of eating at the feedbunk. Data were analyzed using a mixed-effects model accounting for the random effect of period and pen and the fixed effects of treatment and intake level class and their 2-way interaction. CTRL and HL Heifers spent more time ($P < 0.05$) eating than HHL and HLL heifers (6.9 ± 0.6 min/hr vs. 5.8 ± 0.6 min/hr respectively). There was no significant effect of intake level class in HHL, HL and HLL ($P > 0.05$) with high eaters spending 6.0 ± 0.4 min/hr eating and low eaters spending 6.3 ± 0.4 min/eating. In this study, grouping calves according to their individual feed intake had no effect on time spent eating post-grouping.

Key Words: calves, heifers, eating behavior

W11 Association between behavioral patterns and risk of elevated somatic cell count in lactating dairy cows. M. E. A. Watters¹, K. Meijer¹, H. W. Barkema², K. E. Leslie³, M. A. G. von Keyserlingk⁴, and T. J. DeVries^{*1}, ¹Dept. of Animal and Poultry Science, University of Guelph, Kemptville Campus, Kemptville, ON, Canada, ²Dept. of Production Animal Health, University of Calgary, Calgary, Alberta, Canada, ³Dept. of Population Medicine, University of Guelph, Guelph, Ontario, Canada, ⁴Animal Welfare Program, University of British Columbia, Vancouver, British Columbia, Canada.

The objective of this study was to determine the association between dairy cow standing and lying behavior patterns and risk of experiencing

a newly elevated somatic cell count (SCC). Five commercial free-stall dairy herds, milking 3x/d, were enrolled in a longitudinal study. Forty Holstein-Friesian cows/herd were selected as focal animals based on DIM (< 200 d) and SCC ($< 100,000$ cells/mL). The study consisted of four 5-wk periods. Cow-level composite SCC was recorded at the beginning of each period and the end of the final period. Elevated SCC (eSCC) was used as an indicator of subclinical mastitis. Incidence of a newly eSCC was defined as having a SCC $> 200,000$ cells/mL at the end of each period, when SCC was $< 100,000$ cells/mL at the beginning of the period. Standing and lying behavior of the cows, as well as the times of milking and fresh feed delivery, were collected for 5 d after each SCC sampling using data loggers. A multivariable logistic regression model was used to assess the relationship between post-milking standing time and occurrence of a newly eSCC. There was no effect of the time of feed delivery on post-milking standing time, which averaged 97.4 ± 15.5 min. Over the study period 48 newly eSCC were detected, resulting in an incidence rate of 0.97 eSCC/cow-year at risk. A non-linear relationship between post-milking standing time and eSCC incidence was found ($P = 0.01$). Those cows that lie down > 90 min after milking were found to have a lower risk (OR = 0.38, 95% CI = 0.18, 0.80) of an eSCC compared with cows that lie down for the first time < 90 min after milking. Further, the risk of experiencing an eSCC was increased ($P < 0.01$) in multiparous cows (OR = 3.72, 95% CI = 1.37, 10.14), and in cows with a higher SCC at the beginning of the study (OR = 1.92, 95% CI = 1.44, 2.55; for one standard deviation [23,071 cells/mL] increase in initial SCC). These results indicate that management practices that promote longer post-milking standing time may be recommended to reduce the risk of free-stall housed cows experiencing newly eSCC. This should, in the longer term, reduce the overall prevalence of eSCC.

Key Words: free-stall, somatic cell count, behavior

W12 Association of social rank during the prepartum period with health, reproduction, and milk production of dairy cows. K. M. Lobeck,^{*} M. I. Endres, P. R. B. Silva, and R. Chebel, University of Minnesota, St. Paul.

The objective of this study was to examine social rank during the close up prepartum period and its association with health, reproduction, and milk production during early lactation. The study was conducted in a freestall sand-bedded dairy farm in south-central Minnesota from June to August 2011. One hundred and 90 Jersey cows were enrolled in the study 5 weeks before expected calving date. Cows were balanced for body condition score and those cows with locomotion score > 2 were not included in the study. Displacements from the feed bunk were measured during 3 h on the day of move-in (d0) at $13:00 \pm 1:00$ and following fresh feed delivery ($05:00 \pm 1:00$) on d 1, 2, 3 and 7 of each wk. A displacement index was calculated as the number of displacements initiated by a cow divided by the number of displacements initiated plus number of displacements received by a cow. Cows with a displacement index of < 0.4 were categorized as low-ranking, 0.4 to 0.6 middle-ranking, and > 0.6 were considered high-ranking. Health events for the first 100 DIM, milk production and composition for the first 3 DHIA tests, and first breeding pregnancy rate were recorded for each cow. The Logistic procedure was used to evaluate health and reproductive events. The Mixed procedure was used to analyze milk and milk composition. There was no association of social rank with retained placenta, metritis, death, displaced abomasum, and mastitis events. Displacement index was associated with first breeding pregnancy rate ($P < 0.01$). Middle rank cows were 3 times more likely to become pregnant after first AI than low ranking cows with no differences between low ranking and high ranking cows. There was no association between milk production

and social rank. Percent milk fat from the second test was associated with social rank ($P = 0.04$). Milk fat percentage was greater in low ranking cows than high-ranking cows (4.1 ± 0.13 vs $3.7 \pm 0.16\%$). Middle-ranking cows, however, had similar milk fat percentage to low and high-ranking cows. In summary, social rank in the prepartum period was associated with pregnancy status and 2nd test milk fat percentage in early lactation dairy cows. However, pregnancy status may be more complex than simply being associated with social rank.

Key Words: social rank, displacements, dry cow

W13 To move or not to move: When should dairy cows be moved to maternity pens? K. L. Proudfoot*¹, M. B. Jensen², and M. A. G. von Keyserlingk¹, ¹University of British Columbia, Vancouver, British Columbia, Canada, ²Aarhus University, Tjele, Denmark.

Cows are often moved from a group to an individual maternity pen just before calving. However, moving cows too soon before calving may alter their behavior and delay labor. The aim of this study was assess if moving cows to a maternity pen at different time periods before calving would influence labor or cow behavior. Thirty-six multiparous Holstein dairy cows were moved from a group to 1 of 10 maternity pens adjacent to the group pen. Cows were moved either 3d before calving, or when signs of calving were present. The time of moving relative to calving was determined retrospectively and cows were assigned to 1 of 3 treatments: “very late” (2.5 ± 1.2 h (mean \pm SD) range 1.5 to 5 h; $n = 12$), “late” (12.9 ± 4.0 h, range 8 to 20 h; $n = 12$) or “early” (83 ± 23 h, range 37 to 122 h; $n = 12$). Calves were weighed within 12 h of birth. Using video, behavioral data collected 4 h before calving was used to approximate the length of the second stage of labor (the time between first ‘expulsive’ contractions, recorded when the cow’s abdomen engaged in rhythmic movements, to the delivery the calf). During the 1h before calving we recorded the total time of contractions, lying time and number of position changes made by the dam. The effect of treatment on these variables was tested with ANOVAs (Proc GLM in SAS); treatment was a fixed effect and calf BW and cow parity were covariates. There was an effect of treatment and calf BW on the length of the second stage of labor; cows with heavier calves ($P = 0.01$) and those moved very late took longer to expel the calf (very late = 76.6 ± 6.9 , late = 56.9 ± 5.6 , early = 58.3 ± 6.6 min; $P = 0.02$). Cows with heavier calves spent more time having contractions 1 h before calving ($P = 0.03$), but there was no effect of treatment ($P = 0.42$). Cows moved very late spent twice as much time standing 1h before calving (very late = 25.5 ± 4.5 , late = 12.4 ± 3.6 , early = 11.6 ± 4.3 min; $P = 0.01$), but there was no effect of treatment on the number of position changes ($P = 0.85$). Results suggest that moving cows within 5h of calving from a group to a maternity pen prolongs the second stage of labor, and this may partly be driven by a longer time spent standing during the final hour before calving.

Key Words: transition, labor, calving

W14 Web forums as a method for engagement on contentious issues in dairying: Should cows have access to pasture? M. A. G. von Keyserlingk,* C. A. Schuppli, and D. M. Weary, University of British Columbia, Vancouver, BC, Canada.

Animal welfare is emerging as one of the key social concerns regarding animal agriculture. Key welfare concerns include poor biological functioning (such as ill health), negative affective states (such as pain and distress), and inability to engage in important natural behaviors (such as the ability to walk and turn around in tethered cattle). Some concerns

are shared broadly by the public and within the dairy industry. In other cases, practices within the dairy industry may fall out of step with public expectations in part because the industry lacks mechanisms to discuss these issues. For example, many producers no longer provide access to pasture for dairy cattle, but people outside the industry may view pasture and grazing behavior as important elements of cattle welfare. We used web-based virtual “town hall” meetings to provide opportunities for people to comment on the question “Should dairy cows be provided access to pasture”? A total of 178 people participated in 5 web forums. Across all groups the majority of participants (73%) chose “Yes,” 24% chose “Neutral” and 3% chose “No.” Responses varied with participant demographics, but the large majority of both producers (89%) and people not associated with the industry (91%) felt that cows should be provided access to pasture. Veterinarians, other dairy industry professionals and students, often chose “Neutral” (43%); the reasons participants used to explain their neutral votes included that they considered pasture access desirable but difficult to achieve on some farms because of a lack of available land, and concern about reduced milk production. That the majority of respondents indicated that cows should have pasture access suggests that common practice in the dairy industry (i.e., a high usage of zero grazing systems) does not correspond with widely held values of participants both within and outside of the dairy industry.

Key Words: animal welfare, attitudes, grazing

W15 Social learning of feeding behavior in weaned pigs: Effects of the familiarity with conspecific model on flavor preferences. J. Figueroa,* D. Solà-Oriol, J. F. Pérez, and X. Manteca, Universitat Autònoma de Barcelona, Bellaterra, Barcelona, Spain.

It has been observed in other species that feed cues can be transferred from one animal (demonstrator) to another (observer) due to a social learning process. The aim of this experiment was to evaluate if preferences for a flavor can be modified by previous interactions with conspecifics in pigs and if acquired preferences are affected by the familiarity of the demonstrator. A total of 256 piglets (49-d-old) were used. Animals were separated in 2 groups depending on the familiarity of the demonstrator/model. Sixteen pens (8 pigs/pen) were used for the familiar demonstrator condition (G1). Four animals per pen were randomly selected to act as observers and 4 as demonstrators. Demonstrator animals were temporarily moved to an empty pen where a flavored feed (anis (A) or garlic (G); 0.075%) were offered for 30 min. After that, demonstrator piglets were mixed again with the observer animals for 30 min. In the unfamiliar demonstrator condition (G2), the same procedure was performed but unfamiliar next-door pen demonstrators were used. Flavors were counterbalanced across pens to act as the social or control flavor. After interaction time, a double choice test (DCHT) between A and G flavored feeds was performed in each observer group. Feed intake was measured after 30 min. Data was analyzed by using the GLM procedure of SAS. Intake was higher in observer pigs when the flavors had been previously eaten by familiar rather than by unfamiliar demonstrators (264g vs. 167g; $P < 0.01$). Animals that learned from a familiar conspecific showed higher intakes of the social learned flavored feed over the control flavored feed (264g vs. 154g $P < 0.005$). On the other hand, animals that interacted with unfamiliar conspecifics did not show different intakes during the DCHT between both feeds. It is concluded that piglets, like other mammals, are able to prefer flavors previously learned by social interactions, and that the familiarity of a conspecific demonstrators play a key role in learning probably due to less aggressive behaviors that allows them to get a close mouth to mouth contact.

Key Words: social, learning, pigs

W16 Effect of feeding DDGS diets on behaviors of gestating sows in different housing systems. Y. Z. Li*¹, L. J. Johnston¹, S. K. Baidoo², C. E. Phillips³, L. H. Wang¹, X. L. Xie¹, and G. C. Shurson³, ¹West Central Research and Outreach Center, University of Minnesota, Morris, ²Southern Research and Outreach Center, University of Minnesota, Waseca, ³Dept. Animal Science, University of Minnesota, St Paul.

The high fiber content of DDGS (distillers dried grain with solubles) may affect behaviors and welfare of limited-fed gestating sows both in stalls and group-housed systems. A study was conducted to investigate the effect of feeding diets containing DDGS on stereotypic behaviors of gestating sows housed in individual stalls (n = 27, wt = 176.8 ± 16.5 kg) and aggression in group-housed system (n = 40, wt = 174.3 ± 14.1 kg). All focal sows (parity 1 and 2) were fed either control or treatment diets during their previous gestation and lactation. Control diets (CON) were corn-soybean meal based formulated according to NRC (1998) recommendations for gestating or lactating sows. Treatment diets (DDGS) were nutritionally identical to CON but included 40% DDGS during gestation and 20% during lactation. Behaviors of focal sows were video-recorded for 24 h during 4 to 8 d after breeding. For group-housed sows, video-recording was conducted immediately after mixing, and was analyzed by continuous observation of aggressive interactions involving focal sows during the entire 24 h. For stalled sows, video-recording occurred 10 d after sows were moved into stalls, and analyzed by instantaneous scan sampling of behaviors of interest (resting, eating, stereotypies, and others) at 5-min intervals for 24 h. Data were analyzed using Proc Glimmix of SAS. In the group-housed system, sows fed DDGS were more aggressive, fought for longer periods (16.49 vs. 3.98 s/sow/h; $P = 0.05$) and tended to fight more frequently (0.82 vs. 0.37 fights/sow/h; $P = 0.06$) compared with CON sows. In gestation stalls, sows fed DDGS spent more time resting (73.1% vs. 66.4%; $P = 0.02$) and less time performing stereotypic behaviors (23.3% vs. 28.5%; $P = 0.05$) compared with CON sows. Eating behavior was not affected (2.3% vs. 2.9% for treatment and CON, respectively) by dietary treatment. These results indicate that the effect of feeding DDGS diets on behavior and welfare of gestating sows depended on housing system. In the group-housed system, dietary DDGS increased aggression among sows at mixing, and consequently, may compromise welfare of sows. However, in gestation stalls, sows fed DDGS spent more time resting and less time performing stereotypic behaviors, indicating improved satiety and welfare of sows.

Key Words: behavior, DDGS, sow housing

W17 Piglet behavior as a measure of viability. R. Muns, E. G. Manzanilla, X. Manteca, and J. Gasa,* *Servei de Nutrició i Benestar Animal, Departament de Ciència Animal i dels Aliments, Universitat Autònoma de Barcelona, Bellaterra, Barcelona, Spain.*

The aim of the study was to develop a vitality scoring method based on piglet behavior which may be related to piglet growth and mortality during lactation. Two hundred sixty-six piglets, from 21 multiparous sows, were used. Within 3 h after the end of the farrowing (d 0), piglets were weighed and individually tested for 2 parameters (Table 1) in a circular enclosure (55cm diameter) receiving a U and N score and a total UN score (sum of U and N: 0–3). All the sows that needed intervention during farrowing were excluded, and piglets were not removed from the dam. Piglets were weighed again on d 1 and d 20 (weaning). Piglet rectal temperature (RT) was recorded on d 0, 1, 2 and 3. Sow farrowing information was also recorded. Regression analyses were performed using GLIMMIX procedure of SAS for survival, and GLM procedure of SAS for body weight (BW) gain and RT. Piglet BW gain

at weaning was influenced by BW at birth ($P < 0.001$), sow parity ($P < 0.05$), total number of piglets born per sow ($P < 0.001$) and UN score ($P < 0.05$). Piglet rectal temperature on d 3 was influenced by BW at birth ($P < 0.001$), litter weight ($P < 0.001$), and UN score ($P < 0.05$). Piglet survival during lactation was influenced by BW at birth ($P < 0.05$), N score ($P < 0.05$) and RT on d 3 ($P < 0.10$). Furthermore, N score is highly related with piglet survival and may be a good criterion to identify piglets with a low viability. UN score, in combination with BW at birth and information of the sow might be useful to predict piglet performance during lactation, thus becoming a useful tool to improve piglet management during the first days of lactation. In conclusion, UN score seems to be an easy way to assess piglet vitality for both scientific and commercial purposes.

Table 1. Description of the two different parameters evaluated to establish the vitality of the piglets

Udder searching (U)
0: No searching or udder stimulation behavior within 30s.
1: Searching or udder stimulation behavior within 30s.
Number of rounds (N)
0: Not able to turn 360° nor walk along the limits of the enclosure
1: Able to turn 360° or walk along the limits of the enclosure within 30s.
2: Able to turn 360° or walk along the limits of the enclosure at least twice within 30s.

Key Words: pig, viability, behavior

W18 Habitat selection and ranging patterns of the African elephant (*Loxodonta africana*) in the Pongola game reserve, South Africa. E. Cuthbert,* F. M. van Beest, D. A. Christensen, and R. Brook, *University of Saskatchewan, Saskatoon, SK, Canada.*

African elephants (*Loxodonta africana*) were reintroduced to the Pongola Game Reserve (PGR), South Africa, in 1997 via translocation. Fourteen elephants established the original population in the 73.6 km² reserve and it has since grown to over 50 individuals. Elephant conservation and management has continued to increase in importance throughout the southern African countries, and along with efforts of Space for Elephants, the PGR currently monitors herd health and behavior, as well as habitat use of the elephants. The purpose of this research was to establish the unique dry season ranging patterns of the main herd of female elephants and bull elephants to help determine how they were utilizing the area within the reserve and what habitats they are selecting. Selection ratios were calculated using Jacob's Index to determine the degree of selection in each habitat. A total of 412 GPS location were collected between May and August, ranging patterns showed that the main herd has expanded to the western side of the reserve, increasing possible ranging area by 40 km². Selection ratios for both the main herd and bulls showed a positive selection of 0.59 and 0.54 respectively for Floodplain Grasslands (6.0% of total area of the reserve) and ratios of 0.48 and 0.40 for *Euclea* and *Acacia* thickets (4.2% total reserve area), areas that should have comparatively high moisture levels due to the presence of the Jozini Dam. Negative selection indices were calculated, -0.23 for the herd and -0.14 for bulls, for River line thickets (3.3% total reserve area), and -0.69 and -0.62 for *Acacia* and *Marula* Woodland (38.9% total reserve area). Results of this study indicate that the elephants are expanding their home ranges due to population increases and that dry season ranging patterns are mostly driven by the presence of water and vegetation quality. Further population control methods or herd size reduction may be required to sustain the population and avoid detrimental environmental damage.

Key Words: African elephant, ranging, selection conservation