Effects of mimosa alley-cropped in grass/orb pastures on growth performance of co-grazing sheep and goat wethers were determined. Three sheep (Khatadin) and three goats (#8085 75% Boer), with initial BW of 22.9 ± 0.7 kg, were assigned to one of four treatments: 4- or 8-h access to pasture with high availability of cool-season annual forage on 1200 to 1600), 8 (0800 to 1600), or 24 h; 4- and 8-h wethers were born confined at other times. Periods were at least 18 d in length, with 4 d for total forage collection with bags, 2 d to measure heart rate (HR) and grazing behavior, and 1 d without feed or water for assessing body composition from urea space. EE was based on HR and the predetermined relationship between EE and HR for each wether, and ME intake was the sum of EE and RE. Available forage mass averaged 2,928 and 2,695 kg/ha; SE = 183.4) and after grazing (1,507 and 1,452 kg/ha for WO and W, respectively; SE = 140.4). Percentage of grass in forage determined by transect pre-(57.5 and 69.9%; SE = 8.34) and post-grazing (66.3 and 78.8% for WO and W, respectively; SE = 8.09) was not affected by treatment (P > 0.05). Pre-grazed forage concentrations of N (1.25 and 1.24%), NDF (64.5 and 63.8%), and IVDM (52.9 and 56.2% for WO and W, respectively) were similar (P > 0.05) between treatments, as was also true post-grazing (N: 1.05 and 0.96%; NDF: 66.3 and 69.4%; and IVDM: 49.0 and 48.0% for WO and W, respectively). ADG in the first (125 and 119 g/d; SE = 13.0), second (87 and 108; SE = 26.9), third (106 and 44 g/d; SE = 14.6), and fourth 4-week period (-23 and 0; SE = 27.6) and in wk 1-16 (51 and 68 g/d for WO and W, respectively; SE = 8.6) was similar (P > 0.05) between WO and W. In summary, mimosa increased high-quality herbage available for grazing (mimosa leaf) but did not significantly influence growth performance of co-grazing sheep or goats, perhaps because of decreasing availability as 2-wk grazing periods advanced and/or relatively low intake of mimosa leaf. Supported by USDA Project No. 00-38814-9502.

Key Words: Goats, Mimosa, Co-Grazing

Animal Behavior & Well Being

W182 A computerized system for monitoring feeding behavior and individual feed intake of dairy cattle in loose-house conditions. A. Bach¹,², C. Iglesias², and I. Busto³. ¹ICREA, Barcelona, Spain, ²IRTA-Unitat de Remunits, Barcelona, Spain, ³Diputació de Girona, Semega, Girona, Spain.

The objective of this study was to develop and validate a computerized system to monitor feeding behavior and feed intake of loose-housed dairy cattle. The system consisted of 28 scales located in front of each self-locked place of a regular feed bunk. Rows of cows had access to all scales indifferently. Each visit to the feed bunk was monitored by a transponder in the ear of each cow that was detected by a proximity reader located at the top right corner of each head-lock. The data from the scales and the proximity readers were continuously recorded by a computer with an average scanning time of 3.5 s. The monitoring system was validated using all cows placed on all 28 scales at the same time of the visit to each scale. The observed data were then compared with the computer records. To validate weight monitoring, on separate days the amount of feed consumed by a cow during a visit was also measured manually with an external scale. The average time spent in a given scale by each cow determined by direct observations was similar.
(7 s difference; P=0.60) to that determined by the computer. This small difference supports the application of the computerized system to study feeding behavior. Furthermore, the system was accurate and showed a specificity of 98.8% and a sensitivity of 99.6% for cow detections. Feed weights determined by the computer system were similar (P=0.54) to those measured manually with an external scale (144 g difference). This implies that the system was also accurate in measuring individual intake weights. In conclusion, the system allows for the study of the number of visits per animal, length of each visit, amount of feed consumed per visit and animal, the total amount of feed consumed daily by each animal, and the rate at which animals consume feed.

Key Words: Feeding Behavior, Dairy Cow, Auditing


Our objective was to characterize feeding behaviors of transition cows fed for different intake levels. Thirty Holstein cows were blocked by expected calving date and randomly assigned to treatments. Cows (n=6) from each of three low intake levels (L) were housed in tiestalls from 3d before to 3d after calving. The low intake groups were 2.85 kg (L1), 1.70 kg (L2), and 0.91 kg (L3) of feed per day. The high intake group (H) was fed 3.85 kg of feed per day. Cows were video-taped 24 h/day, using time-lapse video recording, during treatments and until 14d after calving. During the H, L1, L2, and L3 treatments, there were 2.92, 2.09, 1.90, and 1.49 cows per pen, respectively. A total of 10 cows (L1=6, L2=3, H=1) were included in the study. Cows in the L1 group were housed in tiestalls from 28d prior to expected calving and treatments imposed from 15d prior to expected calving through the day of calving. All cows were fed for ad libitum intake post-calving. Cows were video-taped 24 h/day, using time-lapse video recording, during treatments and until 14d after calving. On d -15, -6, -2, 8, and 13 relative to actual calving, durations of standing (S), lying (L), and feeding (F) were measured. A compliance score range for each program should be defined that is considered acceptable to retailers and will assure consumer confidence.

Key Words: Feed Barrier, Feeding Behavior, Dairy Cow

**W186**  Suckling latency in neonatal Holstein calves. H. E. Carpenter*, J. S. Birney, and K. A. Koudel, Andrews University, Berrien Springs, MI.

Neonatal suckling behavior is critical for calf survival. The objective of this study was to determine if the latency of neonatal calf suckling behavior was correlated with the percentage of inbreeding, calf birth weight, calf gender, difficulty of birth (dystocia), or dams Johnes status. Holstein calves (n=372) were evaluated for suckling response when first offered a bottle of warm colostrum. The latency score was on a scale of 1-5: 1=started nursing within one minute, 2=started nursing within 5 minutes, 3=offered bottle again at next regular feeding time, 4=starte seven days after calving. On d -15, -6, -2, 2, 8, and 13 relative to actual calving, durations of standing (S), lying (L), and feeding (F) were measured. A compliance score range for each program should be defined that is considered acceptable to retailers and will assure consumer confidence.

Key Words: Dairy Cattle, Behavior, Transition

The objective of this study was to evaluate the effects of two feed barrier systems on feeding and social behavior of dairy cows. Forty-eight lactating Holstein cows were housed in four pens each with 12 sand-bededded stalls in a completely randomized block design repeated over time. The Holstein breed average is 4.5%. The slow-to-nurse calves require a latency score for group 1 vs groups 2-5 (p=0.06) were calculated from the Holstein Associations Inbreeding Calculator.

The Holstein breed average is 4.5%. The slow-to-nurse calves require a latency score for group 1 vs groups 2-5 (p=0.06). Calves with the score of 1 (77%). There were 86 calves with scores of 2-5 (2=8.6%, 3=10.0%, 4=1.9%, 5=2.7%). No significant difference was found among the groups for birth weight, gender, dystocia score, or dams Johnes status. There was a significant difference between the percentage of inbreeding and latency of suckling score for group 1 vs groups 2-5 (p=0.084). Calves with the score of 1 had an average inbreeding of 4.8%. Those with a score of 2 or greater had an average inbreeding of 5.4%. Inbreeding percentages were calculated from the Holstein Associations Inbreeding Calculator. The Holstein breed average is 4.5%. The slow-to-nurse calves require more time and effort from the calf feeding staff increasing dairy labor costs. The increased suckling latency of neonatal calves may be an unintended consequence of increased milk production over the past 50 years. The percentage of inbreeding is also of concern not only on how it affects suckling in the neonate but also on other aspects of

Our objective was to characterize feeding behaviors of transition cows fed for different intake levels. Thirty Holstein cows were blocked by expected calving date and randomly assigned to treatments. Cows (n=6) from each of three low intake levels (L) were housed in tiestalls from 3d before to 3d after calving. The low intake groups were 2.85 kg (L1), 1.70 kg (L2), and 0.91 kg (L3) of feed per day. The high intake group (H) was fed 3.85 kg of feed per day. Cows were video-taped 24 h/day, using time-lapse video recording, during treatments and until 14d after calving. During the H, L1, L2, and L3 treatments, there were 2.92, 2.09, 1.90, and 1.49 cows per pen, respectively. A total of 10 cows (L1=6, L2=3, H=1) were included in the study. Cows in the L1 group were housed in tiestalls from 28d prior to expected calving and treatments imposed from 15d prior to expected calving through the day of calving. All cows were fed for ad libitum intake post-calving. Cows were video-taped 24 h/day, using time-lapse video recording, during treatments and until 14d after calving. On d -15, -6, -2, 8, and 13 relative to actual calving, durations of standing (S), lying (L), and feeding (F) were measured. A compliance score range for each program should be defined that is considered acceptable to retailers and will assure consumer confidence.

Key Words: Feed Barrier, Feeding Behavior, Dairy Cow
cow productivity such as disease resistance, reproductive parameters, and longevity.

Key Words: Calf Suckling Behavior, Inbreeding

W187 Subsequent effects of an environmental enrichment in the early fattening stage of beef cattle on their behavior, physiology and productivity. T. Ishiwata*, T. Ueta1, K. Uetake1, N. Abe2, Y. Eguchi3, and T. Tanaka1, 1School of Veterinary Medicine, Azabu University, Sagamihara, Japan, 2Faculty of Agriculture, Tamagawa University, Machida, Japan.

We have reported the effects of an environmental enrichment with a drum can. In the early fattening stage of beef cattle (J. Anim. Sci. 81 (Suppl. 1), 2003). The subsequent effects of the enrichment in the middle and finishing stage were investigated. Seventy-one Japanese Black × Holstein steers were allocated, in two repetitive experiments, to 3 pens (6.0 × 9.5 m each): Pen C (control, n=11 and 12) that consisted of a feeding alley for grain feed, a trough for dry hay, a water bowl and resting space; Pen D (n=12 and 12) that a drum can (458 × H 90 cm) that contained hay was added to the control pen; Pen GD (n=12 and 12) that a drum can that was put around an artificial turf (30 × 120 cm) for grooming was added. The drum cans were removed after 5 mo. Behavioral observations were made for 2 h at 10 min intervals after morning and evening feedings for 3 d at 0, 1, 3 and 5 mo after their removal. Jugular vein blood samples were collected and body weight recorded at 1, 3 and 5 mo after their removal. ANOVA, a post-hoc test and a correlation analysis were performed. Although the drum cans had encouraged hay eating during their installation, the number of eating became smallest in Pen GD (P<0.05) after their removal. The number of investigating bars became larger in Pen GD than in Pen C, in which more steers had licked bars (P<0.05). The number of stand-resting became largest in Pen GD (P<0.05), in which steers had been more active (P<0.05). Serum total cholesterol concentrations became higher in Pen D and GD than in Pen C after the removal of the drum cans (P<0.05). Beef belly was thicker in Pen D and GD than in Pen C (P<0.01). In Pen GD, the number of eating from the drum can (r= 0.79, P<0.01) and grooming with it (r=0.63, P<0.05) correlated with beef marbling. Drum cans installed in the early fattening stage sustained positive effects even after their removal and improved the final productivity of beef cattle.

Key Words: Beef Cattle, Environmental Enrichment, Behavior

W188 Effect of increasing sodium bicarbonate proportion in high concentrate diets on performance, intake, water consumption and feeding behavior in finishing beef heifers. L. González*, A. Ferret, S. Calsamiglia, and X. Manteca, Universitat Autònoma de Barcelona, Spain.

Four rumen fistulated Holstein heifers (264 ± 12 kg initial BW) were used in a 4 x 4 Latin square design to determine the effect of increasing levels of sodium bicarbonate (0, 1, 2 and 4 %, on DM basis) on performance, intake, water consumption and feeding behavior. Heifers were allowed to consume concentrate and barley straw on an ad libitum basis, which resulted in a mean forage to concentrate ratio of 12 to 88. Behavior was measured by using scan sampling at 5 minute intervals. Linear, quadratic and cubic effects were analyzed with the Type 1 analysis of variance of the PROC MIXED procedure of SAS with animal and period considered random effects. There was a linear decrease in concentrate DMI (P<0.05) and a linear increase in straw DMI (P<0.01) with increasing buffer proportion in the diet, resulting in a linear decrease (P<0.10) in total DM intake. Protein intake had a linear decrease (P<0.05) with increasing buffer proportion, but there was no effect on NDF intake. Average daily gain decreased linearly (P<0.05) with increasing buffer proportion in the diet, from 1.46 to 0.52 kg/dl. When water intake was expressed as L/d or % BW, no effects were found, but it increased linearly when expressed as L/kg DM intake (P<0.05). Moreover percentage of total daily water drunk in the morning (from 0830 to 1230) increased linearly (P<0.05) with increasing buffer in the diet. Buffer concentration did not affect feeding behavior. Animals spent 19.4 ± 1.25, 8.9 ± 0.42, 2.5 ± 0.16 and 55.5 ± 1.85 percent of the time ruminating, eating, drinking and resting, respectively. The lack of effect on time spent ruminating with a linear increase in straw intake could be due to a reduced concentrate intake. Results indicate that overdosing sodium bicarbonate to finishing heifers fed high concentrate diets may result in a decreased DM intake and animal performance.

Key Words: Beef Heifers, Intake Behavior, Sodium Bicarbonate

W189 Can sheep learn to minimize the length of their foraging path? A. J. Rook* and J. E. Cook, Institute of Grassland and Environmental Research, North Wyke, Okehampton, Devon, UK.

Sheep exploit spatially heterogeneous food resources by selective foraging at preferred patches. But can they minimise the distance travelled to exploit a given set of patches? We laid out a 10 x 10 grid of bowls at 4m spacing in a bare earth arena, filling each of 10, 20, 40 or 50 bowls with 25g concentrate feed (patches). We used a different dry ewe and different random patch positions for each of 3 replicates of each treatment. Each ewe foraged in the arena for 20 min on each of 5 successive days. We recorded the distance the ewe travelled before finding 5 patches and compared this with the shortest possible distance and with the expectation from a random walk. The distance to 5 patches on day 5 was 0.37 that on day 1 for the 10 patch treatment but only 0.67 for the 50 patch treatment. For the 10 patch treatment the distance on day 1 was 4.59 times the shortest possible path but only 1.78 times by day 5. Values for the 50 patch treatment were 2.11 and 1.38. Even on day 1 distance travelled was significantly (P<0.001) shorter than for a random walk as when leaving any bowl (full or empty), ewes continued in the same direction as they had approached it on 64% of occasions. In conclusion after 5 days of learning ewes were close to minimising the distance travelled to find 5 patches. Learning was more marked when the resource was more scarcely distributed. The path taken was always shorter than a random walk.

Key Words: Foraging, Sheep, Optimisation

W190 We have ways of getting you to.... behave! J. K. Haskel* and F. D. Provenza, Department of Forestry, Range and Wildlife, Utah State University, Logan, UT.

Our goal is to increase the use of knowledge of behavior to better reconcile ecological, economic, and social facets of management by conducting outreach, education, and research activities that will: (1) improve economic viability and ecological integrity of pasture- and range-based enterprises, (2) enhance and maintain biodiversity of rangelands, (3) restore pastures and rangelands dominated by weeds, (4) optimize wildlife benefits to land owners, managers, and users, (5) mitigate livestock abuse of riparian areas, (6) improve our ability to manage complex adaptive systems. Behavioral principles and practices, once mastered, provide an array of solutions to the problems people face in managing and improving the integrity of the land. Unlike the infrastructure of a ranch such as corrals, fences, and water development, behavioral solutions cost very little to implement and they are easily transferred from one situation to the next. We know the environment interacting with the genome creates behavioral responses. An animals experience of this in utero and in early in life is especially critical, and continues throughout life. Thus, animals are in the process of adapting to ongoing changes in social and physical environments every day of their lives. Therefore, those willing to understand how environments interact with the genome to influence behavior, have unlimited potential to shape change. The challenge becomes understanding and applying behavior principles. To further that goal, rather than developing and transferring technology packages, we aim to change, fundamentally, the way people understand and use behavior to manage ecosystems. We want people to realize the power of behavior to transform systems ecologically, economically, and culturally. We are involving producers, land managers, extension, and technical assistance personnel in various education and outreach activities, fact sheets, booklets, videos, slide shows, demonstrations, symposia, workshops, and courses. We also have developed a web site (www.behave.net) in concert with the national Agriculture Network Information Center (AgNIC) - to disseminate information about the project.

Key Words: Animal Behavior, Biodiversity, Foraging

Fescue toxicosis is caused by the consumption of toxins found in endophyte infected tall fescue. Cytochrome P450 (CYP) enzymes play an important role in Phase I metabolism of many xenobiotics with CYP3A4 being the dominant CYP in liver. The present study determined if rats fed a diet containing untransformed fescue toxicosis (E+ rats) had increased core temperature (Tc), feed intake, and serum prolactin levels compared to E- rats (P < 0.05). Rats fed ad libitum an E+ diet had increased mean Tc (91.5 ± 0.3 °C) and serum prolactin level (P < 0.05). During acute heat stress, E+ rats had higher mean Tc (91.5 ± 0.3 °C) and serum prolactin level (P < 0.05) compared to E- rats (91.0 ± 0.2 °C and 0.8 ± 0.2 ng/mL, respectively). These results indicate that fescue toxicosis exposure can increase the activity of CYP3A4.

Environmental variations affect an animal’s response to a stressor. This study was to examine whether an enriched environment can reduce stress response to endophyte-induced molting, which has been identified as a managerial stressor to laying hens. At 19 wk of age, 120 mixed breed Leghorn hens were randomly assigned to one of four dietary treatments: conventional cages at 6 hens per cage (645 cm² floor space/ hen), or furnished cages at 10 hens per cage (610 cm² floor space/hen). Furnished cages contained nests, perches, scratch pads, and dust baths (Big Dutchman, Germany). Feed-withdrawal molt was initiated at 72 wk of age. Feed was withdrawn on Day 6, cracked corn was returned on Day 7, diet was changed to pullet feed on Day 14, then to layer ration on Day 21. Physiological data were collected via blood collection on days 13, 0 (prior to feed withdrawal), 1, 5, 7 (prior to feed return), 14, 35, including serotonin, epinephrine, norepinephrine, dopamine, and corticosterone levels, and hematological parameters. Behavioral data were collected on days 0, 2, 4, 6, 8, 9, and 17 using continuous observation from 0900-0930 and 1430-1500.


Rats fed an endophyte-infected fescue (E+) seed diet experience changes in core temperature, feed intake and weight gain similar to those seen in cattle consuming E+. A study was performed to determine dose differences in response to ergovaline (EV), the primary toxin found in E+ seed, and identify sensitivity of the above parameters. Male rats (n=24) were implanted with telemetric transmitters (Mini-Mitter, Inc.) to record core temperature (Tc), and randomly assigned to either endophyte-free diet (E-) or E+ diet delivering low (30.5 μg EV/kg BW/d), medium (61.0 μg EV/kg BW/d) or high (91.5 μg EV/kg BW/d) levels. Feed intake and body weights were recorded daily. Rats were maintained at thermoneutrality (TN; 21°C) during pretreatment and the first seven days of treatment, followed by seven days of heat stress (HS; 31°C). At the end of HS, all rats were euthanized for measurement of organ weights. Feed intake decreased at TN in all E+ groups compared to E- rats (P < 0.05). Maximum reductions in feed intake below pretreatment levels at TN were 47, 42 and 20% for high, medium and low E+ groups, respectively, with additional reductions of 19, 18 and 38% during HS. However, there was recovery of feed intake in both TN and HS periods. Body weights were not different for any treatment group at TN, but rats fed high and medium E+ diets had decreased body weights compared to low E+ and E- groups during HS (P < 0.002). E+ groups were not significantly different from one another for Tc, so were combined for analysis. There was a treatment by day interaction during HS, with E+ rats displaying a slightly higher Tc (P < 0.001). Liver weights, relative to body weights, were decreased in all E+ groups compared to E- rats (P < 0.0006). These results indicate that feed intake and Tc responses associated with fescue toxicosis are separate events, with feed intake being much more sensitive.

Key Words: Fescue Toxicosis, Heat Stress

Key Words: Molt, Furnished Cages, Welfare

W193 Housing effect on behavior and physiology during feed-withdrawal molt in laying hens: furnished cages vs. conventional cages. K. Pohle* and H.-W. Cheng1,2.

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Genetic selection for enhanced production may also affect animals' abilities to cope with stress. In this experiment, the effects of acute stress on physical and hormonal responses were examined in three genetic lines of laying hens: a line selected for high group productivity and survival (KGB), a line selected for low group productivity and survival (MBB), and a commercial line (DXL). All genetic lines were reared in separate cages in two environmentally controlled rooms, at 4 hens/cage (114 in2/hen). At 17 weeks of age, hens housed in one room were transported to a laying facility and re-caged (transport and mixing stress). The re-caging procedure ensured that all hens were unfamiliar, with a single genetic line in the cage. Hens housed in the second room were reared without interruption and served as controls. Both control and stressed hens were sacrificed 24 hours after treatment. Tissue samples and physiological characteristics, including body weight, right adrenal gland, and blood, were collected and analyzed for physiological parameters associated with the stress response. There were no significant differences in the relative adrenal glands among the control hens from all three lines (ANOVA, P=0.004) and exploratory pecking (ANOVA, P<0.001) following feed withdrawal. In furnished cages, compared to their behaviors before molt, hens increased dust bath usage (ANOVA, P=0.01) during the feed withdrawal period. These results indicate that housing conditions do not fully compensate for the physiological stress induced by feed-withdrawal induced-molt.

Key Words: Chicken, Acute Stress, Genetic Selection
Gait abnormalities affect millions of commercial broilers reared each year. Previous studies demonstrated that exercise can improve bone strength and decrease leg problems. We examined the incidence of gait abnormalities in Ross broilers (N=312) raised in either enriched or standard pens. Enriched pens contained two platforms and two perches. Perches and platforms were 8cm above the floor, and platforms were connected to the feeders so birds had to use them in order to reach the food. The following measurements were taken: gait, measured using the latency to lie (LTL) test, number of jumps (JMP) during the LTL test, final body weight (BW), and the incidences of tibial dyschondroplasia (TD) and femoral head necrosis (FHN). T-tests and chi-square tests were used to compare means and proportions. Final BW (controls 3.01 kg, enriched 2.96 kg) did not differ between treatments (p=0.139). Mean LTL was significantly greater for enriched than control birds (403 vs. 271 sec, p<0.009). Mean number of JMP was also significantly (p=0.009) higher for enriched (1.12) than control (0.77) birds. TD was found in 19% of enriched and 14% of control birds, although this difference was not significant (p=0.297). FHN was present in 9% of both enriched and control birds (p=0.869). Enrichment did not have clear effects on the specific leg problems that we measured. However, low LTL scores are a measure of impaired gait, and these results therefore indicate that enriching the environment to increase exercise can improve the walking ability of broilers. This project was funded by USDA Award No.2001-02498.

Key Words: Broilers, Gait Abnormalities, Enrichment

The impact of playbacks of recorded sow gruntings on the development of nursing behavior in sows from two genotypes was studied. Yorkshire x Landrace (YL; n = 16) and 25% Meishan (MH; n = 16) sows were equally divided in two groups: 1) no playback, and 2) playbacks of recorded sow gruntings at 35-min intervals. Recordings were played from d 110 of gestation until d 27 of lactation. Sow behavior was video-taped for 24 h every four days, from d 6 to 26 of lactation. Playbacks decreased nursing intervals in MH (34.9 vs. 38.2 ± 1.1 min) without altering it in YL (37.9 vs. 36.5 ± 1.1 min; breed x treatment, P > 0.05), yet this effect in MH was likely due to the increased frequency of non-productive nursings seen on d 6, 10 and 14 (P < 0.05) in sows subjected to playbacks. In both breeds, the interval between nursing increased (P < 0.01) from d 6 (33.7 ± 0.8 min) to 26 (40.8 ± 0.8 min) of lactation, the interval between non-productive nursings remained similar (P > 0.1) and sows ended more nursings as lactation advanced. More nursings were terminated by sows in MH than in YL (P < 0.01) whereas more nursings were terminated by piglets from YL than MH sows (P < 0.05). Playbacks or genotype did not alter the amount of time over a 24 h period that sows spent standing, sitting, lying on the belly or lying with their udder exposed (P > 0.1), but sows spent more time sitting, standing and lying on their belly and less time lying with their udder exposed as lactation advanced (P < 0.01). Posture changes were more frequent for MH than YL sows (P < 0.01) and increased as lactation advanced (P < 0.01). In conclusion, the effects of playbacks on nursing behavior varied across genotypes and all recorded sow behaviors changed as lactation advanced. Piglets from MH sows seem to play a greater role than piglets from YL sows in optimizing lactation performances, as suggested by their lower willingness to end nursings. (Thanks to Hypor (formerly Genex Swine Group) for supplying the animals).
W199  Novel arena/object test to assess housing related stress in gestating sows housed in stalls and in pens with electronic sow feeders (ESF). L. Ani1, S. Ani1, S. K. Baidoo2, and J. Deen1, 1Department of Veterinary Population Medicine, College of Veterinary Medicine, University of Minnesota, St. Paul, 2Southern Research and Outreach Center, University of Minnesota, Waseca.

Novel object/arena test was conducted on day 108 of gestation among sows housed in individual pens (n = 28 sows) and in pens with ESF (36 sows, 2 pens per 9 sows) to assess the fearfulness of sows when exposed to a novel arena and/or novel object as a measure of the housing-related stress experienced by the sows. A completely enclosed rectangular pen (4.78 m X 2.4 m) was divided into 10 equal segments and numbered one through 10. In the middle, opposite from the side of entrance a semicircle of radius 0.5 m was marked off (arena). The placement of the novel object, a fluorescent cone, was moved each day, one at a time directly from their daily environment. The sow was observed for the first two minutes for the areas it entered within the arena. The sow was considered to be in an area if the snout entered the area. The novel object was placed in area A for the next three minutes and the sow was observed. Data on areas entered, time to approach the object, total time spent in the area A, time to first interaction with the object and number of interactions were recorded. The results of the test were compared using independent sample T-test and Kruskal-wallis ANOVA. More stall-housed sows (16) entered the area with novel object than sows housed in pens with ESF (13). Stall-housed sows took significantly less time (72.5 s) to enter the area with novel object than sows housed with ESF (112.6 s). There was no significant difference among sows from both systems in terms of number of squares entered, time to have the first interaction and number of interactions with the novel object. The results were inconclusive as there was no possibility to account for the excitement in stall-housed sows when they were permitted to have a short walk and in a larger area during the test and the individual differences among sows.

Key Words: Novel Arena/Object Test, Pens with ESF, Gestation Stall

W200  The effect of cold draft on behavior of newly weaned piglets. A. Bruni* and T. M. Widowski, University of Guelph, Ontario, Canada.

Adverse barn environments resulting from poor ventilation or improper temperature control are often blamed for the development of vices in pigs. Behavior problems that can develop at weaning include ear biting, navel sucking and belly nosing. While it is evident that cold, drafty conditions can lead to reduced performance and health problems, any relationship with oral/nasal behavior has never been explored. The objective of this study was to determine the effect of cold draft on oral/nasal behavior of piglets weaned at 18-22 d of age. Piglets were used in each of 5 trials (n=80) comprising 2 pens per treatment and 4 piglets per pen. Piglets were housed in an environmental chamber in which half of the pens could be exposed to cold draft while the other half maintained at recommended temperature and air velocity. Treatment piglets were kept at 27.9 ±0.58C except when subjected to 2-3 h periods of time-unpredictable draft each day during which temperature decreased to 3C and air velocity increased to 0.8 m/s at pig level. Control pigs were kept at 28.1 ±(0.63)C with minimal air movement of <0.3 m/s. Behaviors were observed on d 3, 5, 7, 9, 12 and 15 using scan sampling every 5 minutes for 6 h per day. Overall, piglets exposed to draft spent significantly less time engaged in belly-nosing behavior (0.59 ±0.18%) and more time at the feeder (12.46 ± 0.68%) compared to controls (1.32 ± 0.34% and 9.46 ± 0.69%, respectively; P<0.05). Yet, overall feed intake and growth rates did not differ for the two groups (P>0.05). During periods of cold draft, treatment piglets were more active (17.7 ± 0.02%) and spent more time nosing and chewing their pen-mates’ ears and tails (1.6 ± 0.01%) compared to controls (14.3 ± 0.01% and 1.1 ± 0.01%; respectively; P<0.05). These results show that exposure to cold draft stimulates nosing and chewing pen-mates’ ears and tails but not belly nosing. Adverse environmental conditions may contribute to some oral/nasal behaviors but not others.

Key Words: Piglet Behavior, Belly Nosing, Cold Draft

W201  Analysis of euthanasia and death in swine breeding herds. S. S. Ani*, L. Ani, and J. Deen, Department of Veterinary Population Medicine, College of Veterinary Medicine, University of Minnesota, St. Paul.

The pattern of sow deaths and euthanasia and the factors influencing the likelihood of sows to be euthanized or to have a natural death among the removed sows in commercial swine breeding herds was analyzed retrospectively, involving 24,017 records of death and euthanasia from 17 herds from 1999 to 2003. Logistic regression models were fitted to analyze the association of euthanasia with production variables, season and remove day. Of all the females died and euthanized, 23.6% were euthanized and 16.3% of females were euthanized for painful conditions. Among the sows and gilts those experienced painful conditions, 62.28% and 58.38% respectively were euthanized. The percentage of euthanized sows (5.2) was higher than that of death (3.4) on farrowing day. The euthanasia to death ratio was lower up to 15 days post-farrowing (0.27 on day 15) and then increased with the peak (0.63) during 31 to 35 days post-farrowing. The proportion of deaths was lower during week-ends. As average number of stillborn/litter increased, the likelihood for euthanasia increased among sows (OR 1.067). Sows of parity 1 and 2 were more likely to be euthanized compared to sows of parity >5 (OR 1.121). The odds of euthanasia was less for lactating sows (OR 0.410) than for non-lactating sows. In sows and gilts, the likelihood for those that were never served to be euthanized was higher (OR 2.423 and 1.686 respectively) compared to those served once. The likelihood was lower (OR 0.86) for sows that were served more than once compared to those served once. The likelihood for euthanasia was higher during weekdays (OR 2.824). The farm had a significant influence on the odds for euthanasia. Average number of litters farrowed / year, average number of non-productive days / parity, average number of pigs born alive / litter, average number of mummies / litter and born alive, mummies and stillborn in the removal parity were not significantly (P>0.05) associated with likelihood for euthanasia among sows. The results indicated that sows were at different likelihoods of euthanasia, depending on stage of production. An effort should be made to ensure that care and pain amelioration are available at all stages of production.

Key Words: Euthanasia, Death, Sow

ADSA Growth and Development

W202  Effects of weaning and ionophore on selected blood metabolites and growth in dairy calves. J. L. Klots* and R. N. Heitmann, Department of Animal Science, The University of Tennessee, Knoxville.

Dairy calf weaning is associated with elevated ketone levels in excess of measured rates of utilization in adults and excess concentrations excreted in urine present a potential energy loss. Lasalocid is frequently supplemented as an anticoccidial in calf starters, but in adults is also known to alter molar ratios of ruminal VFA. Jersey bull calves (n = 24) were blocked in groups of two according to birth date and weight and randomly assigned to receive either a commercial pelletted starter (C), or the same diet containing lasalocid (T; 83 mg/kg DM) to examine effects of weaning transition on weight (BW), gain (ADG), and blood glucose, β-hydroxybutyrate (BHBA), non-esterified fatty acids (NEFA), volatile fatty acids (VFA), insulin, and glucagon (GLN) concentrations over 16 wk. From d 3 - 34 all calves were fed milk replacer twice daily, d 35 - 48 received replacer and C or T, and d 49-112 received ad libitum C or T. Repeated measures of BW and metabolite concentrations from jugular samples were recorded weekly. Feeding intake (235 ± 2.34 kg/d; ± 0.07), ADG (0.78 vs. 0.75 kg/d; ± 0.01), and feed:gain (3.10 vs. 3.19; ± 0.11) did not differ between C and T. Glucose and NEFA concentrations did not differ between C and T, but declined with age. Insulin and GLN concentrations did not differ between C and T, but GLN increased with weaning. Total VFA significantly increased following introduction of solid feed at d 35, but there was a 1-wk lag period with T. Acetate and butyrate concentrations were greater in C than T during wk 7 (P < 0.05). Propionate concentrations and acetate : propionate ratios did not differ between C and T. Blood BHBA concentrations were greater in C than T (P < 0.05) during wk 8 and 9 (1.0, 1.1 vs. 0.7, 0.8 mmol/L; ± 0.1). Consumption of starter with lasalocid delayed peak acetate and收到了来自C或T，而在d 49-112使用自由的C或T。重复测量BW和代谢物浓度的标记样本每周被记录。饲养摄入量（235 ± 2.34 kg/d; ± 0.07），日增重（0.78 vs. 0.75 kg/d; ± 0.01），和饲养：增重比（3.10 vs. 3.19; ± 0.11）在C和T之间没有差异。在C和T中，血糖和NEFA浓度没有差异，但随年龄下降。在C和T中，胰岛素和GLN浓度没有差异，但GLN随着喂养而增加。总VFA随着固体饲料的引入在d 35显著增加，但在T中有一个1-wk延迟期。在C和T中，丙酸和丁酸浓度分别大于1.0, 1.1 vs. 0.7, 0.8 mmol/L; ± 0.1。在C中使用lasalocid的喂养延迟了峰丙酸和乙酸，