1) potato peels; 2) screen solids (small potatoes and pieces); 3) fried product (fries, hash browns, batter, crumbles; and 4) material from the water recovery systems (oxidation ditch, belt solids, filter cake). The co-products, except the fried products, ensile rapidly, reaching pH 5 in 7 d or less. Dry matter content varies from 10 to 30% and varies (DM basis) in CP (5 to 27%), starch (3 to 56%), NDF (4 to 41%), and ether extract (3 to 37%) content among types of potato co-product. Type of co-product and frying greatly affect the energy value (0.6 to 1.6 Mcal NEg/kg DM). Composition, quality and shelf-life of meat were not affected by potato co-product feeding in contrast to perceptions of some purveyors and chefs. Potato co-products are important energy sources in beef cattle diets, which, in turn, solve a potentially massive disposal problem for the food processing industry.

Key Words: beef cattle, potato co-products

13 Applying technology with newer feed ingredients – Do the old paradigms apply? M. L. Galyean* and N. DiLorenzo, *Texas Tech University*, *Lubbock*.

Use of co-products like corn and sorghum distillers grain (DG) and corn gluten feed (CGF) in beef cattle finishing diets has increased significantly in recent years, but research to evaluate the efficacy of traditional feeding practices and feed additives when co-products are fed has not kept pace. Grain processing methods that increase starch availability seem equally effective in traditional diets and diets with wet CGF; however, in wet DG diets, some studies have shown decreased efficacy of grain processing, whereas others have shown no evidence of an interaction. Limited data are available on the physical and nutritional value of the fiber in wet DG and CGF; however, CGF at levels ≥ 25% of the dietary DM seems to have some degree of "roughage value," whereas fiber in wet DG has less potential to replace traditional roughage sources. There is little evidence that efficacy of ionophores and antibiotics is changed with diets based on wet CGF or that they interact with addition of wet DG to finishing diets. In vitro data from our laboratory suggest no loss of monensin efficacy in substrates with 15% (DM basis) corn DG in terms of changes in VFA and gas production. Moreover, efficacy of ionophores was not affected in our data by diet substrates with increasing concentrations of S, and in vitro H_2S production in substrates containing wet DG seems predictable from substrate S concentrations. Nonetheless, limited in vivo data suggest lower acetate:propionate ratios with diets high in wet DG, which might affect ionophore efficacy. Likewise, in vivo results suggest that feeding wet DG might decrease ruminal pH; thus, to maximize DMI and minimize digestive upsets, optimal concentrations of roughage need to be evaluated in diets containing wet DG. The effects of yeast products and live microbial cultures in diets with co-product feeds have generally not been determined. Because of the high fiber concentration in CGF and DG, effects of exogenous enzyme preparations on ruminal fermentation and fiber digestion of diets containing these coproducts should be evaluated.

Key Words: coproduct feeds, high-concentrate diet, ionophores

Animal Health: Mastitis, Lameness, and Stress

14 Validation of a novel in-line milk analysis system designed to measure SCC and milk components. H. Karp* and C. S. Petersson-Wolfe, *Virginia Polytechnic and State Insitute*, *Blacksburg*.

The objective of the current study was to evaluate the accuracy of a novel in-line milk testing system for Holstein, Jersey and crossbred populations. The AfiLab system, developed and manufactured by the AfiMilk Corporation (Israel), measured milk components including fat percent, protein percent, lactose percent, milk urea nitrogen (MUN), presence of blood and SCC. Values were collected for each cow at each milking and data were stored using the AfiFarm software program, similar to conventional conductivity measures. The AfiLab system was designed and tested using a purebred Holstein population. However, validation was required for the Jersey and crossbred populations due to the distinct differences in milk components. Composite milk samples were collected daily from Holstein, Jersey and crossbred lactating cows at the Virginia Tech Dairy Center for an 8-wk period using DHI sampling bottles. All samples were preserved with bronopol and stored (4° C) until analysis. Milk analyses were conducted at the DHI Laboratory (Blacksburg, VA) and components measured included fat, protein and lactose percent, as well as, SCC and MUN. Results from the AfiLab system were compared to that from the DHI Laboratory (gold standard). Preliminary data analysis suggested a high level of correlation between the DHI and AfiLab results for both the Holstein and crossbred population. However, a lower correlation was found for the Jersey breed. These results were reported to the AfiMilk Corporation and an adjustment in the algorithms used to calculate the milk components was performed. Following the adjustment, accurate data was achieved for the Jersey breed. The dataset will be complete within 2 wk and a final analysis will be conducted to determine actual correlation values for the 3 breed populations exam-ined. The use of daily milk component data may prove to be an effective way of identifying disease prior to clinical onset of signs.

Key Words: AfiLab, milk components, DHI laboratory

15 Reproduction and milk loss following clinical mastitis compared among J5 vaccinates and controls. D. J. Wilson*, *Utah State University*, *Logan*.

Milk loss and reproduction following clinical mastitis (CM) were compared among J5 vaccinates and controls on 3 commercial dairy farms. Contagious mastitis was well controlled and milk production was approximately 11,350 kg/cow/305 d. Cows were randomly assigned as vaccinates or controls. The vaccine was administered subcutaneously in the supramammary region at dryoff, and again 21-28 d before calving due date. At onset of CM, milk samples were aseptically collected for bacterial culture. Among 306 controls and 251 vaccinates, there were 221 new cases of CM affecting 120 cows. 90% (159/176) of milk isolates were environmental pathogens. Factors significantly associated (general linear model) with change in daily milk production following CM were J5 vaccination, DIM at onset of CM, and herd effect as well as each 2-way interaction between the 3 factors. The adjusted daily milk for 21 d following CM (all agents) was 7.6 kg higher among J5 vaccinates than controls; this protective effect of vaccination waned with increasing DIM at onset of CM. A mixed linear model with AR(1) correlation structure estimated the daily milk production of any cow (whether or not she had CM) on a given DIM. Cows with CM caused by Strep spp., S. aureus, E. coli, and Klebsiella all lost significant daily milk production for the entire lactation relative to non-mastitic cows. Another mixed linear model evaluated only coliform CM cases within

the first 50 DIM. For 21 d following coliform CM less milk was lost by J5 vaccinates than controls, 6 to 15 kg/day. Pregnancy was less likely (chi-square) among cows that had CM caused by E. coli (42% pregnant) or Strep spp. (38% pregnant), while 78% of cows with no mastitis conceived. Days open averaged 131 d for cows with no CM, 162 d for cows that had at least one case of CM. Days until conception, days open, times bred, days until last breeding, and percent pregnant by 200 DIM were not changed with J5 vaccination. An important benefit of use of J5 bacterin appears to be reduction of the loss of daily milk production following clinical mastitis, whether all cases or only those caused by coliform bacteria.

Key Words: mastitis, bovine, J5 vaccination

16 Relationships between rumen lipopolysaccharide and mediators of inflammatory response with milk fat production and efficiency in dairy cows. Q. Zebeli, S. M. Dunn, and B. N. Ametaj*, *University of Alberta*, *Edmonton, Alberta, Canada*.

Milk fat depression is commonly observed in lactating dairy cows fed diets rich in polyunsaturated fatty acids and easily digestible carbohydrates. The objective of this study was to evaluate relationships between rumen lipopolysaccharide (LPS) and mediators of acute phase response with milk fat yield and milk energy efficiency (MEE) in Holstein dairy cows challenged with graded amounts of barley grain in the diet. Eight primiparous, lactating Holstein cows (60 DIM) were assigned to one of the four diets containing barley grain at 0, 15, 30, and 45% (DM basis) in a replicated 4×4 Latin square design with 21-d periods (first 11d of adaptation diet). Rumen and blood samples were collected on d 1, 3, 5, 7, and 10 and milk samples on d 5 and 7 of the measurements period and rumen pH and LPS as well as plasma serum amyloid A (SAA), LPS-binding protein (LBP), C-reactive protein (CRP), haptoglobin, and milk fat content were measured. Results showed a linear increase in the DMI and milk yield with increasing the amount of grain in the diet (P<0.01). Data also indicated that rumen fluid pH (P<0.05; quadratically), milk fat content (P<0.01), milk fat yield (P=0.04), 3.5% fat-corrected milk (P=0.04), and MEE (P<0.01) decreased linearly as the dietary grain to forage ratio increased. Additionally, higher grain diets were associated with greater concentration of rumen fluid LPS and of plasma SAA, LBP, and CRP (P<0.01). Interestingly, data revealed strong negative correlations between rumen LPS and plasma CRP with milk-fat content and yield as well as with MEE (R^2=0.45 to 0.69, P<0.0001). Furthermore, a high inter-individual variation with regards to rumen LPS, plasma CRP, and milk fat production was obtained. Further research is warranted to understand the mechanism(s) by which rumen LPS and inflammatory responses to LPS lower milk fat synthesis and MEE and to develop novel strategies for its prevention.

Key Words: milk fat depression, rumen lipopolysaccharide, acute phase response

17 Joint association of some *Staphylococcus aureus* genes with *in-vitro* biofilm formation and sub-clinical intramammary infection. B. V. Le Thanh[1,3], C. L. Jacob[2,3], S. Messier[1,3], F. Malouin[2,3], K. Pépin Gaudreau[2], and D. Scholl*[1,3], [1]*University of Montreal*, *Saint-Hyacinthe, QC, Canada*, [2]*Univesity of Sherbrooke*, *Sherbrooke, QC, Canada*, [3]*Canadian Bovine Mastitis Research Network*, *Saint-Hyacinthe, QC, Canada*.

Chronic infection is one of the problematic results of intramammary infection (IMI) of dairy cows by *Staphylococcus aureus*. If bacterial

characteristics could be identified that render an *S. aureus* strain more likely to persist as chronic IMI, it could be possible to diagnose these infections for purposes of selective case management. Using a cohort of 91 Canadian dairy farms, a longitudinal study was conducted of the associations of several *S. aureus* genes and biofilm formation with pre-dry off subclinical IMI versus moderate to sever clinical IMI. Biofilm was determined by an *in-vitro* optical density assay and the presence of *S. aureus* genes were determined by multiple multiplex polymerase chain reactions. Isolates that were recovered from sub-clinical pre-dry off IMI displayed a more widely positive distribution of *in-vitro* biofilm formation than did isolates that were recovered from moderate to severe clinical IMI (MW ANOVA p<0.01). The absence of *S. aureus* entero-toxin genes *seg*, *sec*, and *tst*, were each associated with sub-clinical IMI (p-values < 0.03, mixed-random effects logistic regression with herd and parity effects), but the *sen* gene was not, despite having a binary similarity coefficient of 0.80 with *seg*. Absence of the genes *seg*, *sec*, and *tst* were associated with greater biofilm formation as well (MW ANOVA p values < 0.02). The *agr* genotype 1, versus 2 or 3, was also associated with sub-clinical pre-dry off IMI. Moreover, *seg* occurring in the absence of *sen* was associated with the lower biofilm formation (KW ANOVA p<0.01) and lower odds of non-clinical pre-dry off IMI (Pearson Chi-square p<0.01) compared to all other combinations of occurrence of *seg* and *sen*. These observations suggest direct or indirect effects of some *S. aureus* enterotoxin genes on the likelihood of sub-clinical, presumably chrnonic IMI and that biofilm formation may play a role in the effect.

Key Words: intramammary infection, *Staphylococcus aureus*, molecular epidemiology

18 Effect of flunixin meglumine treatment following parturition on cow health and milk production. T. F. Duffield*[1], H. Putnam-Dingwell[1], D. Weary[2], A. Skidmore[5], L. Neuder[4], W. Raphael[4], S. Millman[3], N. Newby[1], and K. E. Leslie[1], [1]*University of Guelph*, *Guelph, ON, Canada*, [2]*University of British Columbia*, *Vancouver, ON, Canada*, [3]*Iowa State University*, *Ames*, [4]*Michigan State University*, *East Lansing*, [5]*Intervet-Schering Plough*, *Desoto, KS*.

A double-blind randomized clinical trial was conducted on two Holstein dairy farms: a research facility in Ontario, Canada and a large commercial dairy farm in Michigan. At both sites, cows received flunixin meglumine (Banamine) at a dose of 1.1 to 2.2 mg/kg intravenously based on a fixed volume of 25 ml and 22 ml for cows and heifers, respectively, approximately 2 hours following calving; and a second injection at the same dose and by the same route, approximately 24 hours later. Weekly milk production and clinical health outcomes were recorded. Dichotomous data was analyzed using logistic regression, while milk production was analyzed using mixed linear models. A total of 148 and 1174 cows were enrolled on the study at the Ontario and Michigan sites, respectively. No significant effect of treatment was identified for milk fever, abomasal displacement, clinical ketosis, or mastitis. However, significant effects of treatment were identified for both risk of retained placenta and metritis. Cows treated with flunixin meglumine shortly following calving were 2.5 (OR=2.5, P<0.001) times more likely to have a retained placenta and 1.5 (OR=2.5, P=0.001) times more likely to be diagnosed with metritis. Milk yield was not significantly different between the two treatment groups. Treatment with a non steroidal anti-inflammatory drug (NSAID) on the day of calving increased the risk of retained placenta and metritis. Based on these results, NSAID therapy on the day of calving is not recommended.

Key Words: flunixin meglumine, parturition, retained placenta

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19 Use of dermal fibroblasts to identify cows with high and low innate immune response potential. S. Kandasamy* and D. E. Kerr, *University of Vermont, Burlington*.

Resistance to mastitis is dependent on pathogen detection and subsequent activation of the innate immune system. An impaired response may be associated with decreased resistance to infection. We have explored between-cow variation in the ability of their dermal fibroblasts to respond to inflammatory stimuli (IL-1B or *E. coli* LPS) by producing IL-8 and IL-6 as markers of the innate immune response. Fibroblast cultures were established from skin biopsies obtained from 37 mid-lactation cows. Confluent cultures were each challenged with LPS (100 ng/ml) and separately with IL-1B (100 ng/ml). After 24 h the media concentrations of IL-8 and IL-6 were determined and used to rank the animals from high to low (unstimulated cells produced very little IL-8 or IL-6). The five animals with highest and lowest average rankings were designated as high and low responders, respectively. Average IL-8 measured in response to LPS was much greater (P<0.01) in fibroblast cultures from high (2.62 ± 0.30 ng/ml) than low (0.52 ± 0.09 ng/ml) responders. Likewise, the LPS-induced concentration of IL-6 (ng/ml) was greater (P<0.01) in high (2.05 ± 0.43) than in low (0.15 ± 0.04) responders. The IL-IB-induced IL-8 concentrations in the high responder fibroblasts (16.72 ± 2.85 ng/ml) were approximately 10-fold greater (P<0.01) than with the low responder cells, while the IL-1B-induced IL-6 concentrations in the high responder fibroblasts (28.24 ± 4.02 ng/ml) were approximately 15-fold greater than the low (P<0.01). The in vivo response was evaluated in 4 high and 4 low responder cows that were challenged in late lactation with *E. coli* (strain P4; 200 cfu) in one quarter. All cows developed clinical mastitis in the challenged quarter, which in one high responder cow ceased lactating. Milk SCC in the other cows began to decline earlier in the low responder group and was lower ($P\leq0.05$) than the high responder group 12 and 15 days post-infusion (last sample day). These results document substantial between-cow variation in fibroblast production of cytokine markers of the innate immune response, and differences between high and low responders appear to have effects on the resolution of *E. coli* mastitis.

20 Effect of farm, housing and management practices on the occurrence of clinical mastitis and pathogen isolation. Y. B. Hunt[2] and J. K. Margerison*[1], [1]*Massey University, Palmerston North, New Zealand*, [2]*Plymouth University, Newton Abbot, UK*.

The aim of the study was to analyse the incidence of mastitis on the sample farms and compare these with farm management practices. A total of 9 commercial dairy farms were selected at random from the South West of England, they had a full farm assurance audit and matched according to; herd size, housing type, feeding levels and milk yield. Mean herd size was 231, with the greatest proportion of cows being housed in free stalls (cubicles) (0.78) followed by beep bedded (0.22) systems and the mean milk yield was 7,800 l/cow (305 d). Milk samples were collected aseptically from 664 cows, exhibiting clinical mastitis during the first 110 days of lactation. Standard microbiological procedures for culturing mastitis casing pathogens were applied, pathogen presence was assessed using suitably trained and experienced technical staff, while antibiotic susceptibility was assessed by applying antibiotic multidiscs to estimate the effect of the pathogens cultured. Environmental bacteria *E-coli* (25 samples) and *Staph aureus* (17 cows) and *Strep uberis* (16 cows) were the main organisms isolated. Synulox was significantly more effective against *E-coli* and *Staph aureus*. There was no significant difference between farms of the types of bacteria found. In terms of management practices, two farms had significantly lower levels of mastitis, which coincided with free stall housing with sand or sawdust with cow mats, and hot and cold water parlor washing. In conclusion, mastitis levels were found to be higher on farms with poor hygiene and housing management practices.

Key Words: mastitis, dairy, management

21 The effect of lameness in Holstein Friesian dairy cattle on live weight, milk yield, milk let down and milking duration. J. A. Hollis[2] and J. K. Margerison*[1], [1]*Massey University, Palmerston North, New Zealand*, [2]*Plymouth University, Newton Abbot, UK*.

The aim of this study was to assess the effect of lameness on yield, milking duration, body condition score and live weight. A total of 40 multiparous Holstein Friesian dairy cattle were selected at random and were split into two groups of either; 20 lame (L) or 20 non lame (NL) according to the locomotion score (0 to 5 point scale) at 110 d postpartum, such that the cows in each if the two group were paired according to calving date, milk yield, body condition and live weight. Data was normally distributed and means were compared using a General linear model ANOVA to establish the existence of significance differences (P<0.05). Following selection, the lame cows had a significantly greater (P<0.001) locomotion score compared with non-lame cows (NL: 1.01, L: 3.57 ($\pm$0.445)). Lame cows had a significantly (P<0.05) lower body condition score (1 to 5) (NL: 3.24, L: 2.87 ($\pm$0.064)), a significantly (P<0.05) lower mean milk yield (NL: 42.3, L: 38.7 ($\pm$0.60)) and significantly (P<0.05) lower milking duration (m) (NL: 7.03, L: 6.06, ($\pm$0.224)) compared with non-lame cows. While, no significant difference was found between live weight per se (NL: 654, L: 646 ($\pm$5.5)) the change in live weight was significantly different (P<0.05) as lame cows lost weight compared with non lame cows which gained weight. In conclusion, lameness reduced milk yield, body condition score, milking duration and increased liveweight loss compared with non lame cows.

Key Words: lameness, live weight, milk yield

22 A comparison of measures of stress following administration of either lipopolysaccharide (LPS) or corticotropin-releasing hormone (CRH) to Brahman bulls and heifers. L. E. Hulbert*[1], J. A. Carroll[1], M. A. Ballou[4], J. W. Dailey[1], L. C. Caldwell[2,3], A. N. Loyd[2,3], N. C. Burdick[2,1], R. C. Vann[5], T. H. Welsh, Jr.[2], and R. D. Randel[3], [1]*Livestock Issues Research Unit, USDA-ARS, Lubbock, TX*, [2]*Texas AgriLife Research, Texas A&M System, College Station*, [3]*Texas AgriLife Research, Texas A&M System, Overton*, [4]*Department of Animal and Food Sciences, Texas Tech University, Lubbock*, [5]*MAFES, Mississippi State University, Raymond*.

A better understanding of cattle responses to various stressors is needed for production and health improvement, yet it is often difficult to decipher if stressor-specific physiological effects are neurendocrinological, immunological or both. The objective of this study was to compare and contrast the temporal aspects of rectal temperature (RT), heart rate (HR), white blood cell (WBC) counts and WBC differentials following either a LPS or CRH challenge. Brahman heifer (H) and bull (B) calves were fitted with indwelling jugular catheters, HR monitors and RT devices. The following day, calves were challenged with an i.v. bolus of LPS (0.25 μg/kg BW; H:n=6, B:n=5) or CRH (0.5 μg/kg BW; H:n=6, B:n=6). Blood samples were collected at 1-h intervals from 2 h prior to challenge through 8 h, and at 12 and 24 h. Blood was analyzed using a Cell Dyn for WBC (10^6 cells/mL) and differentials. HR (beats

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per min, bpm) and RT (°C) data were continuously collected from 10 h before to 24 h following challenge and were averaged into 10-min intervals prior to analysis. Data were analyzed using ANOVA specific for repeated measures. Baseline measures were defined as data collected prior to the challenge and were averaged and used as a covariate. The first increase in RT from baseline ($P \leq 0.01$) was at 1 h and 7 h for LPS and CRH, respectively. A peak in RT was observed at 4.5 and 9.3 h following LPS and CRH, respectively, returning to baseline for both treatments by 21 h ($P \geq 0.10$). Increases ($P \leq 0.01$) in HR above baseline were observed at 1.5 h after LPS and 2 h after CRH. Overall, HR was $26 \pm 0.1\%$ greater ($P \leq 0.05$) in LPS- than CRH-treated calves from 2.7 to 7.2 h, with both returning to baseline by 23 h ($P \geq 0.10$). After LPS, WBC and neutrophil:lymphocyte (N:L) ratio decreased from 1 to 5 h with a recovery above baseline ($P \leq 0.01$) observed at 8 h. In contrast, WBC and N:L ratio increased 3 to 4 h post-CRH ($P \leq 0.01$). Based upon the parameters evaluated in the current study, a CRH-simulated stress and an acute immunological stress induced by LPS elicit uniquely different physiological and immunological responses.

Key Words: bovine, endotoxin

23 Peripartum measures of stress, inflammation and energy status as predictors for postpartum health disorders in transition dairy cows. J. M. Huzzey*[1], T. R. Overton[1], D. V. Nydam[1], and R. J. Grant[2], [1]*Cornell University, Ithaca, NY*, [2]*W. H. Miner Agricultural Research Institute, Chazy, NY*.

The objective of this study was to measure physiological markers related to stress, inflammation, and energy status during the period around calving to determine if these markers could identify cows at greater risk for health disorders postpartum. Blood was collected weekly from 414 Holstein dairy cows during wk -3, -2, -1 and +1 relative to calving and analyzed for cortisol, haptoglobin (Hp) and non-esterified fatty acids (NEFA). Dairy Comp 305 records were used to collect health events up to 100 days in milk. Data for healthy cows (no health events, n = 195) and those with ketosis (KET; n = 68), displaced abomasum (DA; n = 26) and/or retained placenta (RP; n = 45) are presented; cows experiencing disorders other than KET, DA, or RP were not included in this analysis. NEFA concentrations were higher in the KET, RP, and DA groups relative to the healthy group during each week relative to calving ($P < 0.001$). Cortisol was higher during wk +1 for cows with RP compared to healthy cows (0.9 ± 0.2 vs. 0.5 ± 0.04 µg/dl respectively, $P = 0.009$); however, no other differences in cortisol were detected. During wk +1 plasma Hp levels were higher ($P \leq 0.01$) in cows with RP (1.6 ± 0.2 mg/ml), KET (1.1 ± 0.1 mg/ml) and DA (1.2 ± 0.2 mg/ml) compared to healthy cows (0.7 ± 0.05 mg/ml). During wk -1 Hp was higher for cows that developed DA postpartum compared to healthy cows (0.5 ± 0.2 vs. 0.2 ± 0.02 mg/ml; $P = 0.02$). For every 0.5 mg/ml increase in Hp during wk -1, the odds of developing a DA postpartum were 2 times greater (OR = 1.99, 95% CI = 1.3, 3.0, $P < 0.001$) and the odds of having a DA were 3.1 times greater if the cow had a Hp concentration ≥ 0.8 mg/ml during this period (sensitivity = 19.2%, specificity = 92.8%, $P = 0.04$). Prepartum NEFA and Hp may be useful diagnostic tools to assess risk for health disorders after calving thus providing opportunities for early intervention or management changes.

Key Words: transition cow, health, metabolites

24 Use of rumen temperature for health monitoring in cattle. L. E. Sims*[1], T. K. Dye-Rose[1], C. L. Goad[2], B. P. Holland[1], L. O. Burciaga-Robles[1], D. L. Step[3], C. R. Krehbiel[1], and C. J. Richards[1], [1]*Department of Animal Science, Oklahoma State University*, [2]*Department of Statistics, Oklahoma State University*, [3]*Veterinary Clinical Sciences, Oklahoma State University*.

Heifer calves (241 ± 17kg) were purchased in western Kentucky, comingled, dosed with a remote, continuous monitoring rumen temperature bolus (SmartStock, LLC), and delivered to the Oklahoma State University Willard Sparks Beef Research Center to evaluate the effectiveness of rumen temperature boluses as a health management tool during a 42d receiving period. After arrival, calves were stratified according to High, Medium, or Low arrival blood haptoglobin level. Calves were evaluated each day by two trained individuals to assess calves for signs of respiratory or other diseases. Each calf was given a visual severity score of: 0) normal, 1) mild, 2) moderate, 3) severe, or 4) morbid based on clinical signs. Any animal scored 1 or higher was transferred to processing facility (pulled) for further examination. At examination, if rectal temperature was greater than 40°C, the calf was treated according to a predetermined antimicrobial regimen. Two hundred sixty five calves were used for 21d observation and 168 calves were used for 42d observation. Calves with high haptoglobin levels had a 21d average rumen temperature that was higher than medium ($P=0.05$) and tended to be higher than low haptoglobin levels ($P=0.08$). No differences were detected in 42d average rumen temperature across haptoglobin levels ($P=0.22$). As the number of times calves were treated increased, average 21d rumen temperature increased ($P < 0.01$) and 7 and 21d ADG decreased ($P < 0.01$). Calves were also classified by one of three ADG categories; 1) Low (≤ 0.68 kg), 2) Medium (>0.68 kg and <1.59 kg), and 3) High (>1.59 kg). Calves with low 0-21 and 0-42d ADG had the greatest 21 and 42d average temperature and average maximum temperature ($P < 0.01$), whereas calves with high 0-21 and 0-42d ADG had the lowest 21 and 42d average temperature and average maximum temperature ($P < 0.01$). These results indicate potential benefits of using rumen temperature boluses to assist in health management of receiving cattle.

Key Words: temperature, receiving cattle, health

25 Relationship between milk fat depression and laminitis in early lactating Holstein cows. M. Vazirigohar*, A. Nejati Javaremi, and A. Nikkhah, *University of Tehran, Karaj, Tehran, Iran*.

The objective of this study was to assess association between milk fat depression (MFD) and clinical laminitis in early lactating Holstein cows. In this study, production data were obtained from the Dairy Herd Improvement Center, and laminitis data were collected from 3 large Holstein dairy herds. There was 3380 milk fat-test day in 2 months of early lactating, 1387 cases of MFD (milk fat: protein ratio less than 1), and 344 cases of clinical laminitis up to 4 months of early lactation. Logistic data regression was used to evaluate the association between the occurrence of MFD and subsequent clinical laminitis. This study found that cows that had MFD during 2 months of early lactation were (odds ratio=0.767; 95% confidence interval=0.594 to 0.991) lower risk of clinical laminitis within the next 2 months than were cows without MFD. Risk of laminitis was greater for cows in second, third and fourth lactation (odds ratio = 1.038, 2.784 and 4.764, resp.; 95% confidence interval = 0.668 to 1.1.613, 1.91 to 4.057, and 3.374 to 6.677) than first lactation cows.

Key Words: milk fat depression, laminitis, early lactating Holstein cows

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