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A. Valdecabres, José Pires, N. Silva-Del-Río

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of Veterinary Medicine, University of Missouri, Columbia, MO,
²Department of Animal Sciences, Colorado State University, Fort Collins, CO, ³Department of Animal Sciences, University of Missouri, Columbia, MO.

Fatty liver (FL) is a common condition affecting dairy cows during the peripartum period, with no diagnostic test that is accurate, fast, and low cost. FL can be determined by TG extraction, histopathology or flotation of liver biopsies from live animals. However, these methods are invasive, and at higher risk of hemorrhages, infection and adhesions. Cytology for detection of FL in cattle has not been extensively evaluated. It is feasible in clinical practice, being minimally invasive and inexpensive, and having a rapid turnaround time compared with biopsy. The objective was to estimate the sensitivity (Se) and specificity (Sp) of needle aspiration cytology and histopathology for FL using TG concentrations as the gold standard. Liver samples were harvested from a slaughterhouse in WI, USA. Livers were visually inspected for gross evidence of fat accumulation and classified as follow. (1): Normal—homogeneous maroon color (n = 20), (2): Moderate—moderate yellow-pale color (n = 20) and (3): Severe—more extreme yellow color (n = 20). Biopsies and needle aspiration were carried out from the parietal upper portion of the caudate lobe. Two samples of liver tissue were harvested with a 16 g x 15 cm biopsy needle for histological and TG concentration assessment. A third sample was harvested for cytology using an 18 g x 3.81 cm needle. The content of the needle was transferred to a glass slide, spread and air-dried. TG were assessed by a kit based on colorimetry/fluorimetry. Concentrations <2% were considered normal. Histological and cytological evaluation was blind to the visual classification and conducted by 2 pathologists. Se, Sp, and area under the receiver-operating curve [ROC] were calculated. For cytology, Se and Sp were 73% (95% CI 55.9–86.2) and 85% (95% CI 62.1–96.8), respectively. The area under ROC was 0.79 (95% CI 0.68–0.89). For histopathology, Se and Sp were 45.9% (95% CI 29.5–63.1) and 100% (95% CI 83.2–100), respectively. The area under ROC was 0.73 (95% CI 0.64–0.81). This data suggests that cytology may be a viable less invasive tool for detecting FL in dairy cattle.

Key Words: fatty liver, cytology, histology

366 Factors associated with subclinical hypocalcemia at calving on multiparous Jersey cows.

A. Valldecabres^{*1}, J. A. A. Pires², and N. Silva-del-Río¹, ¹Veterinary Medicine Teaching and Research Center, University of California Davis, Tulare, CA, ²Unité Mixte de Recherche sur les Herbivores, INRA, VetAgro Sup, Saint-Genes-Champagnelle, France.

The objective was to evaluate factors associated with calcemic status at calving on 527 multiparous Jersey cows from 2 commercial dairies. Study variables included: lactation number (Lact; continuous, or 2, 3, ≥ 4); previous lactation 305-d mature equivalent milk production (Pr305ME) and somatic cell count (PrSCC); calving body condition score (BCS; ≤ 2.5, 2.75, ≥ 3) and locomotion score (LS; ≤ 2, 3, ≥ 4); calf number, sex, and stillbirth; and dry period length (dDry). Blood samples for serum Ca analysis were collected from the coccygeal vessels 3 h 14 min (± 2 h 04 min) after calving. Previous lactation information and calving outcomes were obtained from DairyComp305 herd records. Based on serum Ca concentration at calving cows were classified as hypocalcemic (SHC; Ca ≤ 8.5 mg/dL; n = 347) and normocalcemic (NC;

Ca > 8.5 mg/dL; n = 180). Associations among variables were studied using spearman rank correlations and mixed models for continuous, and chi-squared and exact fisher tests for categorical data (CORR, MIXED, GLIMMIX and FREQ procedures of SAS). A significant positive correlation was observed between Lact and BCS, and both were negatively correlated with serum Ca concentration at calving. Cows with SHC had greater ($P < 0.001$) Lact (3.6 vs. 2.7), frequency of Lact ≥ 4 (40.4 vs. 14.4%), dDry (68.8 vs. 64.6 d), and BCS (43.4 vs. 58.2%, 31.2 vs. 27.7% and 25.4 vs. 14.1% for BCS ≤ 2.5, 2.75 and ≥ 3, respectively; $P = 0.02$ [N1]) than NC cows. Twinning rate was higher for SHC than NC (5.8 vs. 1.1%; $P = 0.01$). The frequency of male calves (n = 98) was higher for SHC than NC cows (22.4 vs. 14.0%, $P = 0.02$), however, sexed semen was selectively used on both dairies and these results may derive from herd reproductive management. There was no association of Pr305ME, PrSCC, LS at calving or frequency of stillbirth with calcemic status. These complex associations among SHC, Lact, BCS, dDry, twinning and calf sex, could be used for the decision-making concerning prophylactic SHC treatment at calving.

Key Words: Jersey cow, hypocalcemia

367 Effects of chloride and sulfate-based diets fed to grazing prepartum dairy cows on postpartum plasma calcium.

P. Melendez^{*1}, V. Zaror², P. Gaul², S. Poock¹, and J. Goff³, ¹College of Veterinary Medicine, University of Missouri, Columbia, MO, ²Tribute Dairy, Benton, MO, ³College of Veterinary Medicine, Iowa State University, Ames, IA.

Hypocalcemia is a common metabolic disorder affecting dairy cows during the postpartum period. Lowering dietary cation-anion difference (DCAD) by feeding supplemental chloride or sulfate has been shown to reduce the incidence of hypocalcemia. Different sources of anions have not been extensively compared under practical conditions. The aim of this study was to compare the effect of chloride (Cl) (SoyChlor; commercial chloride supplement) and sulfate (S) (magnesium sulfate) fed to grazing prepartum cows on postpartum plasma Ca. The study was conducted in southeast Missouri, USA in the fall of 2016. Breeds consisted of 20% Holstein, 20% Jersey and 60% crossbred Jersey x Holstein. Cows had been synchronized for breeding such that approximately 600 cows were due to calve in a short period of time. At 30 d before expected parturition, 2 groups of 200 cows each were moved into paddocks where they were fed each day a partial mixed ration (PMR) containing the anionic supplements. Cows had free access to pasture. The PMR would constitute half of the daily DMI. Estimated DCAD for the 2 diets was -25 mEq/kg DM and -26 mEq/kg DM for Cl and S, respectively. Urine samples were collected each week prepartum and checked for pH. Average pre-partum urine pH was 7.71 ± 0.12 and 7.81 ± 0.10 ($P = 0.06$) for Cl and S, respectively. At calving, 42 cows per group were matched by breed and parity (primiparous, multiparous), and their blood was sampled on d 1, 2, 3, and 7 postpartum. Plasma total Ca was determined by atomic absorption spectroscopy. Data for blood Ca concentration were analyzed by developing a mixed model ANOVA for repeated measures and the best covarance structure to fit the model. It is concluded that cows fed a TMR based on chloride had a higher calcium concentration at d 1 than cows fed sulfur as a source of anions.