Animal Health IV

436 I. Demographic trends in livestock inventory and number of operations in the United States. G. M. Schuenemann* and W. P. Shulaw, *Department of Veterinary Preventive Medicine, The Ohio State University, Columbus.*

Food animal veterinary services are important to support rural communities in the US; however, the veterinary supply (shortage) has recently been a source of debate in the academia and representative organizations. The objective of the present study was to estimate the trends of livestock inventory (dairy, beef, sheep, and swine) and the number of operations from 1982 to 2010 in the US. The livestock inventory and the number of operations are the main source of income that supports food animal veterinary practices in rural areas. Over time they provide a description of industry trends and serve as data points or baseline for comparisons for service providers (e.g., veterinarians), input suppliers, producers, and government among others. Historical data collected by the National Agriculture Statistical Services (NASS) were used in the present study. Livestock inventory (millions of heads) by county and the numbers of operations by group size (≤99, 100–499, and ≥500 head) were estimated for 1982 and 2010. The data collected at each point in time was compared to assess the changes (%) between 1982 and 2010 in inventory and the numbers of operations. A reduction in inventory was observed for beef (18.4%), dairy, (15.1%) and sheep (58.4%) while the inventory for swine increased (56%) from 1982 to 2010. Regardless of group size, the overall numbers of operations was reduced for beef (10.4%), dairy (40.2%), sheep (30.7%), and swine (33.6%). The livestock industry has lost about 50% (21–66% range) of small (≤99 head) beef, dairy, sheep and swine operations from 1982 to 2010. For the same period, the proportion of operations with ≥500 head has steadily increased for dairy (250% up) and beef (600% up) herds. Fewer producers of larger size characterized the US livestock industry in 2010 as compared with 1982. The effect of the livestock industry consolidation on the designated food animal veterinary shortage situations in rural areas needs further investigation.

Key Words: livestock inventory, food animal veterinary practice, rural area

437 II. Effect of trends in livestock inventory and number of operations on food animal veterinary practices in the United States. G. M. Schuenemann* and W. P. Shulaw, *Department of Veterinary Preventive Medicine, The Ohio State University, Columbus.*

The number livestock operations and inventory are the main source of income for food animal veterinary practices across rural areas in the US. The objective of the present study was to compare the trends of livestock (dairy, beef, sheep, and swine) inventory (head) and the number of operations by group size (≤99, 100–499, and ≥500 head) from 1982 to 2010 with the designated areas of food animal veterinary shortage for 2010 in the US. Historical data collected by the National Agriculture Statistical Services (NASS) and the Veterinary Medicine Loan Repayment Program (VMLRP; USDA-AFRI, Animal Health) were used in the present study. The VMLRP reported the state-designated veterinary shortage situations by county for 2010 in the US. Type I (Private practice, food animal medicine with at least 80% time) and type II shortage situations (Private practice, rural areas, food animal medicine with at least 30% time) were considered. According to the VMLRP, an estimated 187 shortage areas (628 counties) were reported in 2010. According to the NASS, the inventory and number of operations (≤99 head) has steadily declined from 1982 to 2010 for cattle and sheep, but has increased for swine (56% up). Fewer producers with larger size of operations characterized the US livestock industry in 2010. When data for 2010 from the NASS and the VMLRP were compared, about 30% (Type I) and 52% (Type II) of the counties with veterinary shortage situations had ≤12,000 head of livestock (all cattle, sheep, and swine combined) to support food animal veterinary practices. In 1982, about 3% (Type I) and 13% (Type II) of the counties with shortage situations in 2010 had ≤ 12,000 head of livestock to support food animal veterinary practices. Both livestock inventory and number of operations are vital to support food animal veterinary practices. The livestock industry consolidation (steadily decline in livestock inventory and in the number of operations with ≤ 99 head) may contribute, at least in part, to those designated food animal veterinary shortage situations. The livestock industry consolidation and the food animal veterinary shortage situations warrant further investigation.

Key Words: livestock inventory, food animal veterinary practice, rural areas

438 Estimation of genetic parameters for hoof lesions in Canadian Holstein cows. N. Chapinal*[1,2], A. Koeck[3], S. Mason[4], A. Sewalem[5,6], D. Kelton[1], and F. Miglior[5,6], *[1]Department of Population Medicine, University of Guelph, Guelph, ON, Canada, [2]Animal Welfare Program, University of British Columbia, Vancouver, BC, Canada, [3]Centre for Genetic Improvement of Livestock, Department of Animal & Poultry Science, University of Guelph, Guelph, ON, Canada, [4]Alberta Milk, Edmonton, AB, Canada, [5]Guelph Food Research Centre, Agriculture and Agri-Food Canada, Guelph, ON, Canada, [6]Canadian Dairy Network, Guelph, ON, Canada.*

Impaired hoof health is one the most important welfare and economic problems in modern dairy herds. No direct genetic selection for resistance to hoof lesions has been done so far. The objective of this study was to estimate the genetic parameters of hoof lesions for Holstein cows from Alberta, British Columbia, and Ontario (Canada). Hoof lesions were routinely recorded by 18 different hoof trimmers in 365 different herds from 2004 to 2011. A total of 35,059 records from 27,267 cows were used in this study. Lesions were divided into infection (dermatitis, heel erosion and foot rot), horn lesions (ulcers, hemorrhages and white line disease) and other lesions (e.g., interdigital hyperplasia, fissures). One-trait (any lesion in any hoof), 2-trait (any lesion in the front and rear hooves), and 4-trait (front and rear infection, and front and rear horn lesions) linear animal model were used. For the analyses, the statistical model included the fixed effects of parity (1 to 6), hoof trimmer, and stage of lactation, and the random effects of herd-year-season, permanent environment, animal and random error. Variance components were estimated with REML procedure using a DMU software package. The heritability estimates were: a) 0.06 for the occurrence of any lesion, b) 0.02 and 0.07 for the occurrence of any front and rear lesion, respectively, and c) 0.02, 0.01, 0.08 and 0.05 for the occurrence of front infection, front horn lesion, rear infection and rear horn lesion, respectively. The genetic correlation between the occurrence of any lesion in the front and rear hooves was 0.53. The genetic correlations between the occurrence of front and rear infection and the occurrence of front and rear horn lesion were 0.78 and 0.58, respectively. In conclusion, hoof lesions traits showed genetic variation that needs to be included in routine genetic evaluation for lameness resistance. Standardized hoof health data collection by hoof trimmers should be encouraged. Further analysis using additional hoof health data and conformation traits is in progress.

Key Words: dermatitis, sole ulcer, lameness

439 An international overview of the recording and use of functional traits in dairy cattle breeding and management. J. B. Cole*[1], K. F. Stock[2], J. Pryce[3], A. Bradley[4], N. Gengler[5], L. Andrews[6], and C. Egger-Danner[7], *[1]Animal Improvement Programs Laboratory, ARS, USDA, Beltsville, MD, [2]Vereinigte Informationssysteme Tierhaltung w.V. (vit), Verden, Germany, [3]Department of Primary Industries, Victorian AgriBiosciences Centre, Bundoora, Victoria, Australia, [4]Quality Milk Management Services Ltd., Westbury-sub-Mendip, United Kingdom, [5]University of Liège, Gembloux Agro-Bio Tech (GxABT), Animal Science, Gembloux, Belgium, [6]Holstein UK, Rickmansworth, United Kingdom, [7]ZuchtData EDV-Dienstleistungen GmbH, Vienna, Austria.*

An important component in the development of sustainable dairy production systems is the maintenance of cow health and functionality. Genetic selection has resulted in substantial increases in cow productivity over the past 50 years, but health and fertility are increasingly important determinants of individual profitability. Breeding goals and selection programs are changing worldwide to reflect this shift toward greater functionality. Standardized trait definitions, recording practices and data analyses are needed to ensure that data and genetic evaluations are comparable across countries, but such efforts have proven to be difficult in practice. The International Committee for Animal Recording's Functional Traits Working Group (FTWG) has worked for several years to develop a standard defining best practices for the recording, evaluation, and genetic improvement of functional traits in dairy cattle. A review of past, current, and planned activities in many countries allowed the FTWG to identify key areas in which standards were needed. In addition to indicator traits like somatic cell score for mastitis, direct measures of health and disease will provide valuable information for genetic evaluations. Other traits, such as feed intake, may be developed and used to improve cow functionality. Guidelines for new traits must account for new sources of information and the needs of parties involved in data recording. Technical developments should be reviewed regularly to ensure that data represent the entire population, collection costs to producers and recording bodies are reasonable, and high-quality records suitable for use by management systems and genetic evaluation programs are obtained. A network of experts is needed to support the FTWG's efforts in compiling and updating the guidelines, exchanging information and experiences, and meeting the future needs of the dairy industry. A survey to assess current practices relating to the collection and evaluation of functional data has been distributed internationally.

Key Words: health traits, dairy management, data recording

440 Effect of intrauterine dextrose therapy on reproductive performance of lactating dairy cows with clinical endometritis. M. G. Maquivar*[1], G. M. Schuenemann[1], S. Bas[1], and T. A. Brick[2], *[1]Department of Veterinary Preventive Medicine, The Ohio State University, Columbus, [2]Large Animal Medicine and Surgery Academic Program, St. George's University, Grenada, West Indies.*

The objective was to assess the effect an intrauterine infusion of 50% dextrose in water (DEX) on clinical cure and reproductive performance of lactating dairy cows diagnosed with clinical endometritis (CE) compared with untreated control cows (CON). Cows (n = 1122) from 2 herds were screened using vaginoscopy for CE at 26 ± 3 DIM and scored using a 0—3 scale. Cows scored as 2 or 3 were stratified by parity and randomly allocated into 1 of 2 treatment groups: 1) CON (n = 159) or 2) 200 mL DEX (n = 154). Fourteen days post-therapy (at 40 ± 3 DIM), treated cows were re-examined to assess treatment responses (cure). All cows were presynchronized with 2 injections of PGF2α given 14 d apart (starting at 26 ± 3 DIM) followed by Ovsynch (OV; GnRH-7 d-PGF2α-56 h-GnRH 16 h-timed-AI; TAI) or Cosynch (GnRH-7d-PGF2α-72 h-GnRH^{+}TAI) 12 d later. Cows displaying signs of standing estrus any time during the OV protocol received AI, while the remaining cows were subjected to TAI-16 h after second GnRH of OV. Body condition scores (BCS) were recorded at calving, 26 ± 3 and 40 ± 3 DIM. Pregnancy diagnosis was performed via ultrasonography at 39 ± 3 d post-AI. The proportion of cows that cured (GLIMMIX) and pregnancy up to 250 DIM (PHREG) were assessed. DIM at first service, milk yield at first service, BCS at treatment, rectal temperature at treatment were not different between groups. Cows with CE had greater cervical diameters at the time of treatment compared with cows without CE (n = 809). The proportions of cows that cured (vaginoscopy score of 0) was greater for DEX (48.4%) compared with CON cows (29%; $P < 0.05$). The probability of pregnancy was greater for DEX (HR = 0.74) compared with CON cows (HR = 0.60; $P < 0.05$). The median time to pregnancy was shorter for cows without CE (89 d), or DEX (117 d) compared with CON cows (135 d). The use of intrauterine DEX alone or as an adjunct of antibiotic therapy for the treatment of cows diagnosed with CE or metritis needs further investigation.

Key Words: endometritis, intrauterine dextrose, pregnancy

441 Efficacy of two herbal remedies as alternatives to antibiotic dry cow therapy: Preliminary microbiology results. K. A. E. Mullen,* R. L. Lyman, S. P. Washburn, and K. L. Anderson, *North Carolina State University, Raleigh.*

Mastitis is a costly disease for the dairy industry. It is normally treated using antibiotics either for clinical cases of mastitis or for prevention in nonlactating cows. The aim of dry period preventive therapy is to eliminate existing infections and to prevent new infections from occurring pre-calving. This study evaluated the effectiveness of 2 herbal remedies as dry period treatments: Phyto-Mast (Penn Dutch Cow Care, Narvon, PA) and Cinnatube (New AgriTech Enterprises, Locke, NY). If proven effective, those treatments could potentially reduce antibiotic usage on all dairy farms. Data were taken from 3 private and one research herd over 2 years. Five intramammary dry treatments were assessed: 1) Phyto-Mast; 2) Cinnatube; 3) Phyto-Mast plus Cinnatube; 4) no treatment; 5) Penicillin dihydrostreptomycin plus teat sealant (Conventional). Milk samples were aseptically collected from each functional quarter of each cow (n = 264) before treatment and once within 3 to 10 d post-calving. Microbiological content was assessed using methods consistent with those of the National Mastitis Council. A mixed linear model was used to obtain least squares means and comparisons between treatments were obtained using the Tukey-Kramer adjustment. A cure was defined as the absence of a microbiological species that was present pre-treatment. The scope of the analysis is limited by the positive fact that 130 cows had no infection present pre-treatment and no infection post-calving. Results are given as least squares means ± se. There were no differences among treatments for percentage of quarters per cow with new infections: Conventional 2.8 ± 2.0%, Cinnatube 12.1 ± 4.4%, no treatment 16.0 ± 5.4%, Phyto-Mast plus Cinnatube 16.8 ± 5.7%, Phyto-Mast 17.2 ± 5.8%. For percentage of quarters per cow cured, analyzed from the subset of cows with infections pre-calving (n = 134), there were no differences among treatments: Phyto-Mast 23.4 ± 8.9%, Phyto-Mast plus Cinnatube 21.0 ± 7.9%, no treatment 18.8 ± 7.8%, Cinnatube 15.6 ± 6.7%, Conventional 15.0 ± 12.6%. Though no dry cow treatment was significantly more effective in this trial, the proportion of non-infected cows was encouraging.

Key Words: mastitis, organic, dairy

442 Comparison of low versus high calcium "anionic" diets for prevention of hypocalcemia and milk fever. J. P. Goff*[1] and R. L. Horst[2], [1]*Iowa State University, Ames,* [2]*Heartland Assays, Ames, IA.*

Three questions were addressed with this study. 1) Is it necessary to increase diet Ca when using anions to reduce DCAD to prevent periparturient hypocalcemia? 2) Can adding anions to a "low" Ca diet further reduce hypocalcemia around calving? 3) Are anions effective even if urine pH is not reduced all the way to the target pH of 6.2–6.8? Sixty Holstein cows entering their 2nd or greater lactation were assigned to 1 of 3 treatments. A high wheat straw-corn silage, 1.46 Mcal NEl/kg diet was utilized that was 1.44% K, 0.11% Na and 0.25% P. A high Mg, low Ca, No anion, a high Mg, low Ca, Anion, or a moderate Mg, high Ca, Anion supplement was added to the basal diet to create diets (see Table 1). Diets were fed for at least 2 weeks before calving and plasma Ca was determined weekly and within 7 h after calving and again at 24 ± 7 h after calving. Dry matter intake before calving was similar across all treatments with cows averaging 13.4 kg/d from 14 to 3 d before calving. The pH of urine collected during the wk before calving and blood Ca concentrations (mg/dl) (Mean + SEM) close to calving (Time 0 and 24 h) are presented (see Table). Plasma Ca was significantly improved (ANOVA, $P < 0.05$) at calving by both Low and Hi Ca anion supplementation – despite the fact that anions were not added in high enough quantity to decrease urine pH to the "target pH." Use of anions to prevent hypocalcemia does not require addition of Ca to the diet. The effectiveness of a "low calcium" diet to prevent hypocalcemia can be improved by adding anions.

Table 1. Diet composition; urine pH and plasma Ca observed

Treatment	% Ca	% Mg	% Cl	DCAD (mEq/kg)	Urine pH	Plasma Ca Time 0	Plasma Ca at 24 h
Lo Ca, No Anion	0.46	0.65	0.44	+162	8.20 ± 0.06	7.17 ± 0.31	7.44 ± 0.34
Lo Ca, Anion	0.46	0.66	1.24	−61	7.07 ± 0.17	7.95 ± 0.24	8.09 ± 0.24
Hi Ca, Anion	0.78	0.48	1.26	−68	7.41 ± 0.17	8.05 ± 0.27	7.98 ± 0.35

Key Words: milk fever, DCAD, hypocalcemia

443 Variation in metabolic, hematologic, and innate immunologic parameters in early postpartum dairy cows is not largely influenced by dairy, days in milk, or parity. M. D. Sellers,* A. R. Pepper-Yowell, D. L. Hanson, C. R. Nightingale, C. J. Cobb, B. S. Obeidat, and M. A. Ballou, *Department of Animal and Food Sciences, Texas Tech University, Lubbock.*

The objective was to partition total variation in metabolic, hematologic, and immune variables in early postpartum dairy cows among dairy, days in milk (DIM), and parity (LACT). Two hundred forty Holstein cows, 2–8 DIM and 2nd-8th LACT, from 8 dairies were sampled across 5 d (BLK; n = 6 cows/dairy/day). Metabolic measurements included plasma nonesterified fatty acids, β-hydroxybutyrate, glucose, and urea nitrogen concentrations. Hematologic measurements included total leukocytes and differentials, and immunologic measurements included neutrophil oxidative burst capacity to an *Escherichia coli*, neutrophil L-selectin expression, plasma haptoglobin concentration, rectal temperature, as well as tumor necrosis factor-α and interferon-γ concentrations in stimulated whole blood cultures with lipopolysaccharide and phytohemagglutinin, respectively. Type III sums of squares were estimated using PROC Mixed with the fixed effects of DIM, LACT, and the random effects of dairy and BLK. No differences were observed in regard to DIM ($P > 0.22$) or LACT ($P > 0.14$). Data are reported as η^2, representing the proportion of the total sums of squares for each effect. For metabolic parameters, DIM accounted for an average of 2.2% of total variation, LACT an average of 2.9%, and dairy an average of 4.3%, with residual variation accounting for an average of 75.1%. For hematologic parameters, DIM accounted for an average of 3.4% of total variation, LACT an average of 2.8%, and dairy an average of 4.2%, with residual variation accounting for an average of 85% of total variation. For immune parameters, DIM accounted for an average of 3.1% of total variation, LACT an average of 2.7%, and dairy an average of 9.8%, with residual variation accounting for an average of 78.1% of total variation. Differences among dairy, DIM, and LACT did not explain a large portion of the total variation across each class of variables; whereas residual effects likely associated with genetics, metabolic status, and health status contributed to the majority of the total variation.

Key Words: immune, metabolic, transition cow

444 Production and metabolic response of lactating dairy cows supplemented with a dietary antioxidant to intramammary infusion of lipopolysaccharide during thermoneutral and heat stress conditions. A. L. Kenny*[1], Y. M. Yang[2], N. M. Barkley[1], R. R. Rodrigues[1], G. I. Zanton[2], and M. R. Waldron[1], [1]*University of Missouri, Columbia,* [2]*Novus International Inc., St. Charles, MO.*

The response to intramammary lipopolysaccharide (LPS) infusion during heat stress in 24 lactating dairy cows fed the antioxidant Agrado Ultra (dry blend of ethoxyquin and propyl gallate) was investigated. Holstein cows (153 ± 5 d in milk) were randomly assigned (complete block design) to 1 of 2 treatments: Control (soy hulls 6.1 g/cow/day; n = 12) or AOX (AGRADO Ultra 6.1 g/cow/day; n = 12). Cows were housed in a free stall barn until d 14 of treatment and then housed in environmentally controlled rooms for 7 d at thermoneutral temperature (TN; d 15 to 21; Constant 20°C) and then 14 d of programmed 12-h cyclical heat stress (HS; d 22 to 35; Mean THI range 72.5 ± 0.1 to 81.3 ± 0.5). On d 20 (TN) systemic plasma and quarter milk was sampled and sterile saline (10 mL) infused into the right front quarter of the mammary gland and LPS (100 ng/10 mL saline) into the right rear quarter. Rectal temperature, respiration rate were measured, and systemic plasma and milk from the 2 quarters were sampled 1, 2, 3, 4, 6 and 12 h after infusion. This process was repeated on d 34 (HS) using the left quarters. Data were analyzed using SAS by mixed model ANOVA with repeated measures. Data collected at 0 h were used as covariates if found to be significant. Rectal temperature and respiration rate increased during HS ($P < 0.01$) and somatic cell count was greater in the LPS quarter than the saline quarter ($P < 0.01$). All milk components changed over time ($P < 0.01$) and between TN and HS ($P < 0.01$); however, these responses were similar for both saline and LPS quarters. The saline quarter of control cows had a greater percent of milk lactose ($P = 0.03$) and a tendency ($P = 0.08$) for fewer somatic cells than the saline quarter of AOX cows. All other responses of milk components and metabolites to LPS infusion were similar between control and AOX ($P > 0.05$). The addition of antioxidant to the diet of lactating dairy cows did not alter the response of plasma metabolites or milk components to intramammary infusion of LPS.

Key Words: dairy, antioxidant, lipopolysaccharide

445 Potential risk of western juniper-induced abortion in beef cattle. C. T. Parsons*[1], D. R. Gardner[2], K. D. Welch[2], D. Cook[2], J. A. Pfister[2], and K. E. Panter[2], *[1]Oregon State University, Corvallis, [2]USDA Agricultural Research Service, Poisonous Plant Research Laboratory, Logan, UT.*

Ponderosa pine needles are known to induce late term abortions in cattle. Labdane acids including isocupressic acid (ICA) and agathic acid are the compounds responsible for initiating the abortions. Current research results suggest that an ICA concentration of 0.5% is required for pine needles to be a risk for inducing abortions, while pine needles that contain >1% ICA pose a significant risk. However, stage of pregnancy, amount consumed, snow cover, temperature and other issues contribute to the overall risk. Research on ponderosa pine needles has demonstrated large variation in the concentrations of the abortifacient compounds, both geographically and seasonally. Concentrations vary from location to location as well as seasonal fluctuations in some areas throughout the year. This variability results in differential potential for pine needle-induced abortions to occur depending upon the location and the time of the year. Several other trees, including many species of pine, juniper, cypress and cedar contain either isocupressic acid or agathic acid at concentrations sufficient to be a risk for causing abortions in late term pregnant cattle. In this study, we present data that western juniper (*Juniperus occidentalis*) trees contain compounds known to be abortifacient in cattle and that consumption of large amounts of bark in the third trimester of gestation can induce abortions. We also examined the geographical variation in the labdane acid content of western juniper trees by measuring the labdane acid content of bark, needles, and berries from western juniper trees from 6 different locations in Baker County, Oregon. The berries had a higher concentration of labdane acids than needles ($P < 0.001$) and bark ($P < 0.001$). Interestingly, bark had a higher concentration of labdane acids than needles ($P < 0.001$). However, there was no difference in the concentrations of labdane acids from location to location for berries ($P = 0.33$), needles ($P = 0.13$), or bark ($P = 0.15$). These results indicate that there is a similar risk for western juniper trees to cause late term abortions in cattle across Baker County, Oregon.

Key Words: juniper-induced abortion, western juniper, abortifacient

446 Assessment of daily milk fat and protein composition and the milk fat-protein ratio early postpartum as a predictor for subclinical ketosis in dairy cows. F. S. Lima*[1], C. A. Risco[1], R. V. K. Pereira[2], K. N. Galvão[1], and J. E. P. Santos[1], *[1]University of Florida, Gainesville, [2]Cornell University, Ithaca, NY.*

Objectives were to determine milk fat percentage (%), milk protein % and fat-protein ratio cut-off values (Cv) to predict subclinical ketosis (SCK) during early lactation. A total of 209 cows were enrolled in the study. Daily milk samples were analyzed using AfiLab milk analyzer from Afikim milk system and the daily average % of fat and protein in milk, and the milk fat-protein ratio were calculated for the first 12 d in milk (DIM). Blood samples were collected at 4, 7 and 12 DIM to evaluate the concentration of β-hydroxybutyrate (BHBA). Concentration of BHBA > 1.2 mM was the criterion to determine SCK. The receiver-operating characteristics analysis using MedCalc software was deployed to calculate Cv of milk fat %, milk protein %, and fat-protein ratio for each day before and on the same day when BHBA was measured. A Cv was selected based on the best-combined sensitivity (Se, %) and specificity (Sp, %). Milk fat % at 3 DIM predicted SCK at 4 DIM (Cv > 4.96%, Se = 65.3 and Sp = 69.2). Likewise, milk fat % at 4 (Cv > 4.57%, Se = 78.6 and Sp = 52.2), 7 (Cv > 4.68%, Se = 74.6 and Sp = 60.5) and 12 (Cv = 4.35%, Se = 63.0 and Sp = 76.6) DIM predicted subclinical at 4, 7 and 12 DIM, respectively. Milk fat protein at 7 DIM predicted subclinical ketosis at 7 DIM (Cv < 3.47%, Se = 65.3 and Sp = 69.2). Milk fat-protein ratio on d3 postpartum predicted subclinical ketosis at 4 DIM (Cv > 1.36, Se = 50.0 and Sp = 78.0). Moreover, milk fat-protein ratio at 4 (Cv > 1.31, Se = 69.1 and Sp = 61.6), 7 (Cv > 1.40 Se = 68.7 and Sp = 77.4) and 12 (Cv > 1.56, Se = 40.8 and Sp = 93.7) DIM predicted SCK at 4, 7 and 12 DIM, respectively. Milk composition in the first 12 DIM can be used to predict SCK; however, the Se and Sp of cut-off values were moderate. Thus, because of limited Se or Sp, milk composition in the first 2 weeks postpartum can aid on the diagnosis, but should be used concurrent with other methods to identify cows with SCK.

Key Words: subclinical ketosis, milk composition, dairy cows