pected calving date. Blood was collected by coccygeal venapuncture and serum harvested. Cows were resampled twice weekly until calving. NEFA concentration was measured using the DVM NEFA test and an aliquot was submitted to the Animal Health Laboratory (AHL) at the University of Guelph for analysis by a Hitachi 911 automated analyzer (Roche, Laval, Quebec). The AHL NEFA concentration was considered the gold standard for this evaluation.

Results

A total of 491 samples from 256 cows from eight farms in the Guelph, Ontario area were utilized in this study. The Pearson correlation coefficient between the DVM NEFA and the AHL NEFA determination was 0.75. Using 350 samples drawn within 14 days prepartum, and NEFA ≥ 0.4 mEq/L from the AHL test as the gold standard, sensitivity and specificity of the DVM NEFA test were 84% and 96%, respectively. It is noteworthy that changing the NEFA cut-off level to ≥ 0.5 mEq/L resulted in a similar sensitivity and specificity of 85% and 97%, respectively.

Significance

It was concluded that the DVM NEFA test characteristics were satisfactory for detection of cows with elevated prepartum NEFA.

© Copyright American Association of Bovine Practitioners; open access distribution.

Strategies to Minimize Pain Response Following Dehorning in Dairy Calves

T. Duffield, *DVM, DVSc;* **K. Lissemore,** *DVM, DVSc;* **A. DeHaan,** *DVM;* **S. Millman,** *PhD*
Department of Population Medicine, Ontario Veterinary College, University of Guelph, Guelph, Ontario, Canada, N1G 2W1

Introduction

Three experiments were designed to assess the utility of ketoprofen administration in Holstein dairy calves prior to dehorning on mitigating pain response. Experiments A and C involved the use of a butane dehorner on calves between two days and two weeks of age. Experiment B was conducted on calves between four and eight weeks of age using the electric Rhinehart dehorning device.

Materials and Methods

In experiment A, heifer and bull calves between two days and two weeks of age were dehorned with a butane dehorner. Calves were randomly allocated to receive a lidocaine cornual nerve block, and either an intramuscular injection of saline (placebo) or an intramuscular injection of ketoprofen (treatment). In experiment B, heifer calves between four and eight weeks of age were randomly assigned to the same placebo and treatment allocations as in experiment A, but were dehorned with an electric Rhinehart dehorning device. In experiment C, heifer calves between two days and two weeks of age were randomly allocated to receive either a ketoprofen intramuscular injection only or a lidocaine cornual nerve block only. All injections and nerve blocks were administered at least 10 minutes prior to dehorning.

Calf behaviour was video-recorded between 0-2, 3-5 and 6-8 hours post-dehorning. The video tape observer was blinded to treatment allocation. Scan sampling methodology was used to record the frequency of ear flicks, head shakes and head rubs. Frequency of lying, standing, feeding and self-grooming every minute for the first 20 minutes of each hour were also recorded.

Statistical analysis was conducted with non-parametric Mann Whitney tests and analysis of variance where appropriate in experiment A. Repeated measures poisson regression with the GLIMMX macro was used for the analysis of treatment effects on ear flicks, head shakes and head rubs in experiments B and C. Logistic regression was used to analyse the postural behaviour (standing, lying, grooming) data in experiments B and C.

Results

Experiment A results indicate that a difference in cortisol concentrations from time of dehorning until

three hours later was significantly lower ($P < 0.05$) in the ketoprofen-treated group. All behavioural responses in this experiment were infrequent, and there were no behavioural differences noted between treatment groups.

Analysis of the results from experiment B indicates a 50% reduction in the frequency of ear flicks in ketoprofen-treated calves ($P < 0.05$) during the seven hours following dehorning.

Results from experiment C suggest a tendency for a reduction in the frequency of head shakes in the ketoprofen group ($P=0.09$).

In general behavioural responses in the older calves dehorned with a larger dehorning device were considerably more frequent than that observed in younger calves.

Significance

Our work to date suggests that practitioners should encourage dairymen to dehorn calves at a young age (two days to two weeks) to minimize the behavioural response to dehorning. Additional treatment with ketoprofen at the time of dehorning may be beneficial in alleviating pain response following dehorning in dairy calves.

© Copyright American Association of Bovine Practitioners; open access distribution.

Metabolic Profiling And Health Risk In Transition Cows

R.J. Van Saun, *DVM, MS, PhD, Dipl. ACT and ACVN*
Department of Veterinary Science, College of Agricultural Sciences, Penn State University, University Park, PA

Introduction

Blood chemistry analyses are frequently used by veterinarians for disease diagnosis. Use of blood chemistries in the form of metabolic profiles to determine nutritional status has been advocated, but acceptance has been limited as a result of high cost and interpretation difficulties. Different criteria are needed using blood metabolite concentrations to determine disease potential compared to disease diagnosis. Blood metabolite measures are compared to laboratory-defined reference ranges, however, these reference ranges often are based on mid-to-late lactation cow populations and may not be appropriate for evaluating transition cows. Objectives of this study were to determine effects of time relative to calving and health status on blood metabolite concentrations and determine if any diagnostic relationships are present between prepartum blood metabolite concentrations and postpartum health status.

Materials and Methods

Metabolic profiles were performed on plasma samples collected from 113 cows housed at 15 commercial dairy farms over three time periods relative to calving. These periods were defined as: early dry (ED), >30 days precalving; close-up Dry (CU), three to 21 days precalving and fresh (FR), three to 30 days postcalving. Metabolic profile analyses included urea nitrogen (BUN), creatinine (Cr), glucose (Glu), total protein (TP), albumin (Alb), total bilirubin (TB), alkaline phosphatase (ALP), creatine kinase (Ck), gamma-glutamyltransferase (GGT), aspartate aminotransferase (AST), sorbitol dehydrogenase (SDH), sodium (Na), potassium (K), chloride (Cl), calcium (Ca), phosphorus (P), magnesium (Mg), total cholesterol (Chol), triglycerides (TG), beta-hydroxybutyrate (BHB) and non-esterified fatty acids (NEFA). Disease diagnosis and treatment events were recorded. Blood metabolites were evaluated by ANOVA for repeated measures with period, health and their interaction as main effects and herd as a covariate. Relative risk of postpartum disease was determined using contingency tables of selected metabolite concentration categories and health status.

Results

Of all cows, 53 % had one or more disease events post-calving. Percent healthy calvings varied greatly between herds. Herd was significant in all metabolite models, except NEFA and Ck. Time period influenced ($P<0.05$) all metabolite concentrations, except Ca, P and K. Health status influenced NEFA ($P<0.002$), BHB ($P<0.005$), TG ($P<0.03$), GGT ($P<0.02$) and AST ($P<0.04$) independent of time period. An interaction between time period and health status was found for Alb ($P<0.03$), BUN ($P<0.001$), Glu ($P<0.001$), Chol ($P<0.02$), TG ($P<0.02$), AST ($P<0.0002$), BHB ($P<0.005$) and NEFA