stall, head pressed, salivated and became dyspneic with open-mouth breathing. Cows became tachycardic and had injected mucous membranes. Systolic, diastolic and mean arterial blood pressure was elevated in all cows following peritoneal infusion of the PEP-based lubricant or the pure PEP solution. These remained elevated until death or euthanasia. Three cows were restrained for euthanasia, and two collapsed during restraint. One proceeded to have a convulsive seizure. The cows' serum fibrinogen was decreased, and one-stage prothrombin time was increased. Activated partial tissue thromboplastin time was elevated in the cow that died. Intraperitoneal infusion of PEP-based lubricant or pure PEP solution caused alteration in serum chemistry values. Cows became azotemic (creatinine -4.9 mg/dl), with an increased anion gap (25 mEq/l). The serum had a markedly elevated hemolytic index. Three cows had elevated creatinine kinase, but a high hemolytic index can affect the analyzer's ability to accurately interpret this value. No significant changes were noted in the complete blood counts. Urinalysis was positive for blood and protein.

Necropsy confirmed that the peritoneal infusate was into the peritoneal cavity in all four cows, and that no other structures were damaged. Histopathologic examination revealed no significant lesions, perhaps because the animals were euthanized before lesions could develop in the kidneys. The cause of the agitation, neural signs and respiratory distress cannot be explained by serum chemistry, complete blood counts, or necropsy findings. Both the 1H-NMR and 13C-NMR spectrums for the PEP-based lubricant powder, PEP powder and SUC powder demonstrated that the samples were very clean with no apparent impurities.

Significance

This PEP-based lubricant has proven to be safe and effective for intrauterine obstetrical application throughout many years of use in our veterinary hospital. However, results of this study demonstrate that peritoneal contamination with an amount as small as 1.25 gm PEP is toxic in cows. This equates to contamination of the peritoneal cavity with 1.0 liter of a 0.5% (w/v) solution of the commercial PEP-based lubricant. Veterinarians are advised to use caution if a cesarean section becomes necessary after this PEP-based lubricant has been infused into the uterus of a cow. In such cases it is especially important to prevent any spillage of lubricant into the peritoneal cavity. Human safety issues (powder aspiration) during preparation of the liquid PEP-based lubricant are currently being investigated in our laboratory.

Evaluation of a Rapid Test for NEFA in Bovine Serum

L. Gooijer, *BSc, MSc;* **K. Leslie,** *DVM, MSc;* **T. Duffield,** *DVM, DVSc;* **S. LeBlanc,** *DVM, DVSc;*
N. Perkins, *BSc;* **E. Vernooy** *BSc*
Department of Population Medicine, University of Guelph, Guelph, Ontario, Canada N1G 2W1

Introduction

Excessive or prolonged periparturient negative energy balance (NEB) is an important issue for dairy producers, and may be associated with increased risk of clinical disease and impaired production and reproductive performance. Affected cows commonly have elevated circulating levels of non-esterified fatty acids (NEFA) prior to calving and increased beta-hydroxybutyrate (BHB) postpartum. Monitoring the incidence of subclinical ketosis postpartum has been the recommended method of surveillance for this problem. Prepartum, blood NEFA concentration may be used to detect cows at risk for problems with severe NEB. Serum NEFA greater than 0.4 mEq/L NEFA has been proposed to identify excessive prepartum NEB. Measuring NEFA has traditionally involved submission of serum to a diagnostic laboratory. The DVM NEFA test (Veterinary Diagnostics. Newburg, Wisconsin, USA) is a new, rapid, spectophotometry method to determine NEFA concentration in serum through light absorbance. The objective of this study was to determine the test characteristics of the DVM NEFA test and its usefulness as a method of identifying problems with NEB in prepartum dairy cows.

Materials and Methods

Primiparous and multiparous animals were enrolled between seven and four days prior to their ex-

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.

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