

tal position); and treatment group (TG), table positioned with 5 degrees of inclination (reverse Trendelenburg). Calves were physically restrained and positioned in the supine position on the operating table in the slope determined for each group. Anesthesia was induced via facial mask with 8% sevoflurane in oxygen (5 L minute⁻¹) and maintained at 1.3% MAC, which was previously determined for each animal. A period of 40 minutes was awaited in order to obtain stability of anesthetic concentration and to allow the preparation of the animals. Cardiopulmonary variables (heart rate; systolic, diastolic, and mean arterial pressure, central venous pressure, cardiac output, end-tidal carbon dioxide, respiratory rate, respiratory minute volume, tidal volume, and core temperature) were recorded immediately after the stabilization period (T 0), and then at 30, 60, 120, and 180 minutes. Derived cardiovascular variables (cardiac index, stroke volume, pulmonary and systemic

vascular resistance index) were calculated. Mean values were compared through ANOVA for repeated measures and Bonferroni's *post-hoc* test or through Friedman's test with Dunn's *post-hoc* test. Statistical significance was set at $P < 0.05$.

Results

There were no significant differences in cardiopulmonary parameters between groups.

Significance

The 5 degree reverse Trendelenburg position in dorsally recumbent sevoflurane-anesthetized calves did not improve the cardiopulmonary parameters evaluated in this study.

Comparison of 2 gonadorelin formulations and 2 luteolytic agents on pregnancy rates in beef cattle synchronized with a 5-d CO-Synch + CIDR program

S. Bas¹, DVM, PhD; T.A. Brick¹, DVM, MS; G. Starkey; G. Messerschmidt¹; A.A. Barragan¹, DVM; G.M. Schuenemann¹, DVM, MS, PhD; M.L. Day², MS, PhD

¹Department of Veterinary Preventive Medicine, The Ohio State University, Columbus, OH 43210

²Department of Animal Sciences, The Ohio State University, Columbus, OH 43210

Introduction

Improving reproductive performance in beef cattle is paramount to maximize beef operations productivity and sustainability. Gonadotropin releasing hormone (GnRH) and luteolytic agents (dinoprost tromethamine and cloprostenol sodium) are commercially available to be used in synchronization programs to allow timed artificial insemination (TAI) of cattle. Recently, a Synchronization Pack™ (Parnell) containing a combination of cloprostenol sodium and gonadorelin acetate was approved by the Food and Drug Administration to be used in TAI synchronization programs in both beef and dairy cattle. However, little research-based evidence on the pregnancy rates that can be achieved in beef cattle using these hormones is available. The objective of the present study was to compare the effect of 2 gonadorelin formulations and 2 luteolytic agents (PGF) injected as part of a 5 day CO-Synch + CIDR program on fixed TAI (FTAI) pregnancy rates (PR) in beef cattle.

Materials and Methods

Postpartum beef cows (n = 473) and heifers (n = 78) from 2 herds received GnRH and a CIDR insert on day 0; 5 days later, at CIDR removal, animals received 2 doses of PGF. On day 8, cows and heifers received a second injection of GnRH and were FTAI. At the initiation of the breeding program, cows were blocked by age and days postpartum (DPP) and randomly assigned into 1 of 2 treatment groups. For animals in the control group (CON = 280), the hormones used for the synchronization program were gonadorelin diacetate tetrahydrate (100 µg; Cystorelin®) and dinoprost tromethamine (50 mg (2-25 mg doses); Lutalyse®); while animals in the Parnell group (PAR = 271) received gonadorelin acetate (100 µg; GONAbreed®) and cloprostenol sodium [1000 µg (2-500 µg doses); estroPLAN®]. Determination of pregnancy status was performed by transrectal ultrasonography at 35 to 45 days after FTAI and after the conclusion of the breeding season.

Results

Age (CON = 4.8 ± 0.2 ; PAR = 4.6 ± 0.2), DPP (CON = 73.8 ± 1.6 ; PAR = 75.9 ± 1.5), and body condition score (CON = 6.6 ± 0.9 ; PAR = 6.6 ± 0.1) were not different ($P > 0.05$) between treatments. No difference ($P > 0.05$) in PR at FTAI was observed for the CON (54.9 %) and PAR (55.9 %) treatment groups. Similarly, no difference ($P > 0.05$) in PR was observed between treatments for cows (CON (n= 236) = 55.1 %; PAR (n= 243) = 56.9 %) and heifers (CON (n= 37) = 54 %; PAR (n= 35) = 51.4 %). Breeding season PR (89.8 %) did not differ ($P > 0.05$) between treatments.

Significance

In conclusion, the use of gonadorelin diacetate tetrahydrate plus dinoprost tromethamine (CON) resulted in similar FTAI PR when compared to gonadorelin acetate plus cloprostenol sodium (PAR). The proposed study is significant because it provides relevant research-based evidence on reproductive outcomes (pregnancy rate) following the use of commercially available products approved to synchronize estrous cycles in beef cattle.

The occurrence of flunixin residues in bovine milk samples from the United States

L.W. Kissell¹, MS, PhD; R.E. Baynes¹, PhD, DVM; G.W. Smith¹, PhD, DVM; J.E. Riviere², PhD, DVM

¹Department of Population Health and Pathobiology, North Carolina State University, Raleigh, NC 27695

²Department of Anatomy and Physiology, Kansas State University, Manhattan, KS 66506

Introduction

Flunixin (FLU) is a non-steroidal anti-inflammatory drug (NSAID) approved in the United States for use in beef and dairy cattle for modulation of inflammation in endotoxemia and for the control of pyrexia associated with bovine respiratory disease and acute bovine mastitis. FLU is labeled for intravenous administration at a dose of 2.2 mg/kg every 24 hours or 0.5 mg/lb (1.1 mg/kg) every 12 hours for up to 3 days. The slaughter withdrawal time is 4 days following the last injection and the milk withdrawal time is 36 hours. Since 2005, the United States Department of Agriculture-Food Safety Inspection Service (USDA-FSIS) has reported an increasing number of residue violations in meat from dairy cattle (USDA-FSIS, 2005-2010). This increase in the number of FLU residue violations has led to FLU becoming the second most common residue violation behind penicillin in cull dairy cattle (USDA-FSIS). In milk the marker residue is a metabolite of FLU, called 5-hydroxy flunixin (5OH) and the tolerance for 5OH in milk is 2 ppb. Milk samples in the United States are not routinely tested for 5OH (National Milk Drug Residue Data Base Fiscal Year 2011 Annual Report). However, due to the significant number of FLU tissue residues violations found in cull dairy cows, there is concern that the same practices which have led to tissue residues may also lead to drug residues in milk.

Materials and Methods

A total of 500 samples were collected from 8 different processing plants in different regions of the United States. Plants were located in California, Colorado, New Mexico, Ohio, Tennessee, Indiana, and Utah. However, these were all fairly large processing plants and received milk from multiple states. Some tanker loads represented milk from a single large dairy while other tankers represented milk from multiple dairies that had been comingled together. All milk samples had already been screened for antibiotics but had not undergone any processing (i.e. pasteurization or homogenization).

All 500 milk samples were analyzed for FLU using 2 different approved screening tests, the CHARM[®] Flunixin test and the Alert Flunixin Assay. Each milk sample was run using both assays and positives were confirmed using an ultra-high-pressure liquid chromatography (UPLC) with mass spectrometric (MS) detection method.

Results

Of the 500 milk samples tested for the presence of 5OH residues, 1 sample was found to have a 5OH concentration greater than the tolerance limit using both screening methods. This milk sample was confirmed positive for 5OH using UPLC-MS. The concentration of