lb (10,640 kg) of milk and 21,403 lb (9,729 kg) of milk for the controls.

Significance

Although cows may not be showing any overt lameness, hard surfaces may affect their overall milk production. There wasn't any difference in any of the health categories for cows with and without boots, but the number of animals in the trial may not have been large enough to detect such a difference. But because any difference will be small, from a practical herd health evaluation, boots placed on non-lame cows will probably have little effect on the overall health of the animal in the first 60 days of transition. However, this study did demonstrate a significant milk production advantage to cows in the first 42 days, with a significant increase in early milk production for cows with boots even when lameness was not an issue. Therefore, the hard surfaces of many of our modern commercial dairies may be having an effect on early peak milk, and it may be worth evaluating surfaces to promote better foot health and comfort. Feet and leg health is both a welfare and economic issues for most commercial dairies.

Reproducible Challenge Model for BVDV Vaccine Efficacy Studies

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Introduction

Accurate determination of vaccine efficacy is dependent upon the use of challenge viruses that reproducibly cause notable clinical disease. Historically the challenge virus, made available by the Center for Veterinary Biologics, for vaccine efficacy studies and licensing is the BVDV type 1 strain NY-1. Clinical signs following infection with this strain are minimal and consist of a small rise in temperature, usually lasting less than 48 hours, and a 20% or less transient drop in circulating lymphocytes. Because the clinical signs following infection are so mild, it is difficult to assess disease protection after vaccination when this virus is used as the challenge. In this study we provide documentation of the clinical presentation following infection with a highly virulent type 2 BVDV. This virus, 1373, was isolated following an outbreak of severe acute BVDV in Ontario, Canada in 1993. Acute, uncomplicated infection with this virus reproducibly results in clinically severe disease as described below.

Materials and Methods

Two studies were performed. In the first study 10 colostrum deprived calves two to four months of age, free of BVDV and antibodies against BVDV, were infected with 1373. Four non-infected age-matched animals served as controls. Animals were housed in individual pens and were inoculated by placing 2.5 ml of 1 X 106 TCID/ml 1373 in each nostril using a needleless syringe. In the second study, 40 three-to five-month-old colostrum-deprived calves, free of BVDV and antibodies to BVDV, were randomly divided into three groups. Group 1 consisted of 30 cattle exposed on day 0 to BVDV by aerosolization with 4 ml of 1 x 106 TCID 1373. Group 2 included five cattle vaccinated two to three weeks prior with a commercial modified-live vaccine containing both BVDV1 and BVDV2 strains. Animals in Group 2 were inoculated on the same day and with the same dose of 1373 as the animals in Group 1. Group 3 consisted of five calves that were not vaccinated or inoculated. Basal temperatures were recorded daily and serum, whole blood and buffy coat samples were collected pre-inoculation and at several time points between day 0 and day 21 post-infection. Samples were used to determine lymphocyte count, platelet count, serum antibody titer, viremia and blood chemistry.

Results

All non-vaccinated animals exposed to 1373 developed clinically severe disease characterized by prolonged fever, lymphopenia and thrombocytopenia. In the first study 30% of the animals died or were euthanized by day 20. In the second study, 73% of the animals died or were euthanized by day 20. All infected animals had increased serum levels of alkaline phosphatase, AST and BUN in the acute phase of infection. Animals that died or became moribund also had increased creatine, CK,

GGT and TBIL levels following the acute phase of infection, suggesting multiple organ tissue damage (e.g., liver and renal failure). There were clear and significant differences in clinical presentation between non-vaccinated animals and vaccinated animals.

Significance

These results demonstrate that infection with 1373 resulted in reliably severe clinical disease that can easily be tracked based on febrile response, circulating lymphocyte counts and platelet counts. Clinical disease could be ameliorated by vaccination. Differences in clinical presentation between vaccine protected animals and non-vaccinated animals were clear, distinct and significant. These finding support the use of this strain as a challenge virus in efficacy studies.

Risk Factors Associated with *Neospora caninum* Herd Serological Status in Beef Cow-Calf Herds in Canada

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Introduction

Neospora caninum (*N. caninum*), a protozoan parasite, is a major cause of reproductive failure in cows all over North America and in other regions of the world. Infected cows are at risk of early embryonic death, abortion, stillbirth, birth of a weak or abnormal calf and birth of a calf with no obvious defect, depending on previous exposure and the phase of gestation–early, mid or late. The dog has been implicated as a definitive host of *N. caninum* and contributing to fecal-oral (horizontal) transmission. It has been suggested that neonates become infected while *in-utero* (vertical transmission). The role of wild canids, coyotes and foxes in transmitting infection in beef cow-calf is still not clear. Although suggested, it is not known if extensive husbandry and management methods employed in beef cow-calf plays a role in *N. caninum* infection, transmission and disease occurrence in beef cow-calf herds. The objective of this study was to determine seroprevalence of *N. caninum* in beef cow-calf herds in Canada and to identify potential risk factors contributing to seroprevalence.

Materials and Methods

Two mailings were sent during the winter and spring of 2003 to a total of 3000 randomly selected cow-calf herds from the Canadian Cattle Identification Agency list of cow-calf herds in Canada. Producers that agreed to cooperate on the study were sent a 19 page questionnaire to be filled out by the herd manager. The questionnaire included questions on the farm profile, breeding management, calves and calving management, feeding management, veterinary procedures and vaccinations, and biosecurity practices. During the fall of 2003, blood samples were collected from 30 randomly selected cows from each herd at fall round-up time. These samples were centrifuged and serum was frozen. Serology for *N. caninum* was performed using the IDEXX ELISA test kit. Herds were considered positive for *N. caninum* if at least two cows were seropositive. The Chi square test was performed for categorical variables and T-test for continuous variables in screening for potential risk factors for bovine neosporosis; significance was set at $P \leq 0.05$. Significant variables were further ana-