sample, the mid-dry sample, the freshening sample and the calf samples. Geometric mean titers of the calves to BVDV were 337.8, 181.0, 272.7 and 256 for control, vaccine A, vaccine B and vaccine C, respectively; titers for BHV-1 were 84.4, 32, 38.7 and 58.7 for control, vaccine A, vaccine B and vaccine C, respectively; titers for BRSV were 5.6, 4.5, 4.8 and 4.4 for control, vaccine A, vaccine B and vaccine C, respectively; titers for PI3 were 955.4, 456.1, 701.6 and 608.8 for control, vaccine A, vaccine B and vaccine C, respectively. There were no statistically significant differences in geometric mean titers between the vaccine and control groups. Similarly, no statistically significant differences in geometric mean titers were noted among any of the other collected samples.

Conclusions

The results of the calf samples suggest that vaccination with a killed viral vaccine at the time of pregnancy confirmation in a herd that currently uses a modified-live vaccine after freshening offers no beneficial effects on post-colostral immune status in calves as measured by agent specific titers. Furthermore, the post-vaccination titers of the cows taken approximately 60 days after vaccination do not demonstrate a significant humoral immune response by the cows to the vaccine. This implies that the use of these killed vaccines does not stimulate a humoral immune response above that produced by annual vaccination with this modified-live viral vaccine.

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[1] *Bovi-Shield 4*, Pfizer Animal Health, Exton, PA
[2] *Cattlemaster*, Pfizer Animal Health, Exton, PA
[3] *Vira-Shield 4+L5*, Novartis Labs, Freeman, SD
[4] *Master Guard Preg 5*, Agri-Labs, St. Joseph, MO

Luteal Function and Conception in Lactating Cows and Some Factors Affecting Luteal Function after Insemination

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Introduction

Reduced steroidogenic capacity of the corpus luteum (CL) during early luteal phase has been reported to cause decreased fertility in cows. Higher concentrations of progesterone were observed in pregnant cows 5-10 days after artificial insemination (AI) compared to non-pregnant cows. However, the extent to which luteal sub-function affects fertility in high producing dairy cows is not clear. The present study, therefore, was undertaken to: 1) investigate the type and incidence of luteal sub-function after insemination; 2) to study the relationship between post-insemination luteal sub-function and conception rate; and 3) clarify the relationship of luteal function with parity, body condition score, milk yield and dietary intake.

Materials and Methods

Daily milk samples were collected in 19 lactating Holstein Friesian cows after AI, starting from the day of insemination up to confirmation of pregnancy. A total of 30 post-insemination progesterone profiles were obtained. Progesterone from defatted milk was extracted with petroleum ether and assayed by EIA. The peak progesterone concentrations, the progesterone area under the curve (AUC) and the days of CL formation (first rise of P4 to 1.0 ng/ml) were determined. The average dry matter intake (DMI), total digestible nutrient (TDN), digestible crude protein (DCP) and milk yield for the first 15 days after insemination were calculated and correlated with AUC. Body condition scores (BCS) were recorded for 10 representative cows from the day of parturition up to the day of first insemination at two-week intervals.

Results and Conclusions

Fifteen (50%) of the 30 progesterone profiles were normal, with the P4 concentration reaching 1.0 ng/ml within five days after insemination and ≥ 2.0 ng/ml thereafter. Six (20%) profiles were stunted (P4 concen-

trations remained < 2.0 ng/ml); five (17%) were delayed (P4 reached 1.0 ng/ml after d 5); two (7%) were delayed and stunted; and one (3%) was short (P4 >1.0 ng/ml for only seven days). In one (3%) event, progesterone remained basal. The conception rate was higher (P<0.01) in the events when P4 profiles were normal than events with abnormal profiles (87% vs 33%, respectively). BCS appeared to have no relationship with the AUC, but the AUC was negatively correlated with milk yield (r= -0.83, P <0.01), DMI (r=-0.81, P<0.05), TDN (r= -0.83, P<0.05) and DCP (r=-0.79, P<0.05).

In conclusion, high milk production and increased dietary intake might result in reduced P4 concentration, which might lead to reduced conception rate.

Impact of Two Coliform Mastitis Immunization Schedules on Immune Response, Milk Yield, Intramammary Infection and Dry Matter Feed Intake in Holstein Dairy Cattle

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Introduction

Although coliform mastitis immunization programs are widely implemented, several questions concerning the proper administration schedule remain unanswered. Thus, a comparison of two vaccination protocols was conducted to determine the effects on immune response, milk production, milk bacteriological status and dry matter intake (DMI).

Materials and Methods

A total of 198 animals from two research herds were enrolled two weeks prior to drying-off (74 days before expected calving in heifers) and randomly assigned to one of two immunization protocols. The Standard group involved immunization at drying-off, three weeks before expected calving (transition) and 2-9 days after calving. In the Experimental group animals were immunized at two weeks prior to drying off, at drying off and at transition. Each immunization consisted of 5 ml of *Escherichia coli* J5 vaccine (Envirocor®) in conjunction with 0.001 grams ovalbumin (OVA) antigen dissolved in phosphate buffered saline. Blood was collected at weeks –10 (enrollment), -8, -3, 0, 2 and 9 relative to parturition. Serum was analyzed for anti-*E. coli* and anti-OVA antibody by ELISA. Daily milk production data were obtained for 60 days in milk (DIM) after parturition. Quarter milk samples for bacteriological culture were aseptically collected on days three through nine, and prior to treatment for all clinical cases of mastitis. After calving, DMI was collected for the 24 hours before and 24, 48 and 72 hours after immunization in the Standard group, and the same dates for non-immunized animals in the Experimental group.

Results

Milk bacteriological analysis of fresh cow quarter samples revealed 13 quarters with *E. coli* in the Standard group and 4 quarters in the Experimental group. There were 61 clinical mastitis cases cultured in the Standard group, of which 12 cultured positive for *E. coli*. Of 43 clinical mastitis cases identified in the Experimental group, 11 had *E. coli*. A total of 22 and 9 cases of clinical mastitis resulted in no bacterial pathogen growth in the Standard and Experimental groups, respectively. Multi-variable regression analysis on factors affecting the DMI for 144 animals on the day following immunization revealed that increasing parity, and the DMI value for the day prior to immunization had a significant positive effect ($P<0.001$). Using a generalized linear model, analysis of the mean daily milk production to 60 DIM for 189 animals showed that immunization group had no effect when controlling for farm location, season and parity. Due to high background antibody levels, ELISA results for anti-*E. coli* antibody showed no difference between the two immunization protocols. Statistical analysis on