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55 Investigating the Potential Benefits of an Immunostimulant (Mycobacterium Cell Wall Fraction) Treatment on Increased Pregnancy Success of Embryo Transfer Recipients. Trinity Vidlund[1], Stefania Pancini[1], Guillermo Goncherenko[1], Nicholas W. Dias[1], Hannah Craun[1], Zachary Klonicke[1], Randall Hinshaw[2], Matthew Switzer[2], Ryan Giles[2], Vitor R G. Mercadante[3], [1]*Virginia Tech,* [2]*Ashby Genetics,* [3]*Virginia Tech–School of Animal Sciences, Large Animal Clinical Sciences*

Abstract: Modulating the vaginal and uterine microbiome through the use of immunostimulants has the potential to improve fertility in cattle. The object of this study was to evaluate the potential benefits of an immunostimulant, mycobacterium cell wall fraction (MCWF), to increase pregnancy success of embryo transfer (ET) recipients. The three main objectives of this study were: determining if injecting ET recipient cows with MCWF increased proportion of cows with a corpus luteum (CL) on ET day, identifying differences in CL volume and progesterone concentration at the time of ET, and determining if ET recipients that received MCWF have greater pregnancy rate. A total of 926 beef cows at eight different locations were enrolled in this study. Primiparous and multiparous cattle were enrolled in a 7-day CO-Synch + CIDR estrous synchronization protocol. During this protocol, cows received an injection of GnRH (100-µg) at CIDR (controlled internal drug release) insertion [d -9], a prostaglandin $F_{2\alpha}$ injection (25 mg), and CIDR removal [d-2] followed by another injection of GnRH (100 µg; d 0) within 60-66 hours after CIDR removal. At each location at (d 0), cows were sorted based on BCS and days post-partum and randomly assigned to one of two treatments: 1) MCWF- a single intramuscular injection (5 mL) of MCWF at (d 0; Amplimune, NovaVive Inc.; n = 452) or 2) Control- a single intramuscular injection (5 mL) of saline (n = 474). Seven days after (d 7), cows were examined by ultrasonography to determine if a CL was present. Recipient cows that had a CL received ET with a frozen or fresh in vivo or in vitro produced embryo in the ipsilateral uterine horn to the CL, with embryo type and grade balanced between treatments. Blood samples were collected in one location (n = 98) for analysis of plasma concentration of progesterone on (d 7) ET day. Pregnancy diagnosis was then performed by ultrasonography between 30 and 90 days of gestation. Data were analyzed using the GLIMMIX and MIXED procedures of SAS. Cow BCS and days postpartum were similar ($P > 0.10$) between treatments

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(5.5 ± 0.6 and 103 ± 14 days, respectively). Recipient cow utilization rate was similar between treatments (P = 0.49; 81.2 ± 0.42%). At the time of ET MCWF had larger CL than Control cows (5,768.6 ± 133.7 and 5,408.0 ± 128.5 mm^3, respectively, P = 0.03). and increased progesterone concentration (2.68 ± 0.17 and 2.18 ± 0.14 ng/mL, respectively, P = 0.01). However, pregnancy rate to ET was similar (P = 0.922) between treatments (60.9 and 61.3 ± 0.05% for Control and MCWF, respectively). In conclusion, treatment of ET recipient cows with MCWF increased CL volume and concentration of progesterone at the time of ET but failed to generate greater pregnancy rates.

Keywords: beef cows, embryo transfer, immunostimulant

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