

**AGRICULTURAL RESEARCH FOUNDATION  
FINAL REPORT  
FUNDING CYCLE 2013 – 2015**

**TITLE:** Application of a single Lutalyse injection protocol to reduce uterine infections and antibiotic use and improve reproductive efficiency in postpartum cows in an Oregon dairy

**RESEARCH LEADER:** Alfred R. Menino, Jr.

**COOPERATORS: (if any)** None

**SUMMARY:** Uterine infections in postpartum dairy cows are a serious problem for dairy producers not only because of the expense involved in treatment but the accompanying poor reproduction. Our laboratory recently reported improved uterine health and reproductive performance following two injections of prostaglandin  $F_{2\alpha}$  (Lutalyse) administered on either d 0 and 14 or 14 and 28 postpartum. In the current research we evaluated uterine health and reproduction in cows receiving a single injection of Lutalyse delivered on d 14 postpartum. Holstein cows from a commercial dairy were randomly assigned to receive an intramuscular injection of either Lutalyse or saline 14-d postpartum. Uterine swabs were performed to evaluate changes in bacterial populations and services per conception and days open were evaluated to determine the effects on reproductive performance due to treatment. Uterine swabbing was performed at 0 and 24 h after injection. Lutalyse treatment tended to decrease uterine bacterial populations, services per conception and days open. A single injection of Lutalyse 14 d after parturition reduces uterine infections and improves reproductive performance in dairy cattle.

**OBJECTIVES:** The objective of this experiment was to determine the effects of a single injection of prostaglandin  $F_{2\alpha}$  (Lutalyse) delivered on d 14 postpartum on uterine health and reproductive performance in dairy cows.

**PROCEDURES:** Cows in this study were from a dairy containing 3000 Holstein cows with 1500 cows in the milking string. Cows were supplied with water using a free-choice system. The ration fed included corn silage, grass silage, alfalfa, corn, cotton seed and soy bean meal. Postpartum cows were given a 55-d voluntary waiting period before estrous synchronization and artificial insemination. Pregnancy was detected by a veterinarian through rectal palpation and ultrasound at 40 d of gestation. Ovarian structures were also palpated in the event that pregnancy did not occur in order to identify whether inability to conceive was the result of failure of resumption of the estrous cycle.

A total of forty cows at 14-d postpartum were given an intramuscular injection of either  $PGF_{2\alpha}$  (Lutalyse) or saline. The first cow was chosen at random for injection of either Lutalyse or saline and subsequent cows were injected with alternating treatments to ensure randomization. Uterine bacteria samples were obtained at 0 and 24 h after injection through rectal palpation and swabbing the inside of the uterine body. For the 0-h sample recovery, the swab was conducted just before the injection was administered. To recover bacteria, the uterus was first palpated rectally, and once the cervix was grasped securely, the vulva was cleaned using paper towels and spread open and the first guarded tube of the swab was inserted into the vagina. This tube was inserted into the external cervical os and the second guarded tube was pushed thru the first tube into and through the cervix. Once the second guarded tube was in the uterine body approximately 2 cm, the swab was then pushed through the second guard tube and spun gently on the uterine body. The swab was then retracted back into the second guarded tube and both guarded tubes were removed from the vagina. The swab with the uterine sample was broken off and placed in a tube containing 10 ml of Dulbecco's phosphate buffered saline

(DPBS). Samples were brought to the lab and a 1/10 dilution was made from the sample collected in the field using DPBS as the diluting fluid. One hundred microliters of each dilution (0 and 1/10) was spread onto each side of a Blood/MacConkey Agar bacteriological culture biplate. The biplates were covered and left facing up for 1 h at room temperature and placed face down in an incubator at 37°C for 24 h. The numbers of colonies growing on either side of the biplates were counted and recorded. Services per conception and days open were recovered from breeding records maintained for the cows in the experiment.

Differences in numbers of bacteria between the 0 and 24-h swabbing, services per conception and days open were analyzed using one-way ANOVA with treatment (Lutalyse or saline) as the main effect. All analyses were conducted using the NCSS statistical software program (Number Cruncher Statistical System; 2000, Jerry Hintze, Kaysville, UT).

**SIGNIFICANT ACCOMPLISHMENTS:** Changes in uterine bacterial populations did not significantly differ between cows injected with Lutalyse or saline but Lutalyse treatment reduced total bacteria by 30 cells compared to 3 cells in saline-injected cows. No significant difference in services per conception was observed between cows injected with Lutalyse or saline however cows injected with Lutalyse had 0.2 fewer services per conception. Likewise, number of days open for these cows was also not significantly different between cows injected with Lutalyse or saline but cows injected with Lutalyse had 15 fewer days open compared to cows injected with saline.

**BENEFITS & IMPACT:** These data suggest Lutalyse administered to dairy cows 14-d postpartum reduces uterine bacteria, services per conception and number of days open. Dairy producers implementing this protocol would experience reduced costs associated with breeding and using Lutalyse would reduce the overall need for antibiotics.

**ADDITIONAL FUNDING RECEIVED:** Funding (\$10,200) was received from the USDA Animal Health and Disease Program in June 2013. Funding (\$11,000) was also received from the ARF in January 2014 for a proposal evaluating a modified single Lutalyse injection protocol aimed at reducing uterine infections.

**FUTURE FUNDING:** None projected at this time