**Biography:**
Dr. Colin Palmer is an Associate Professor of Theriogenology (Animal Reproduction) at the Western College of Veterinary Medicine. Originally from Nova Scotia, Dr. Palmer worked in mixed practices in Ontario and British Columbia and has owned/operated a practice in Saskatchewan. Dr. Palmer along with his wife Kim and children Lauren, Emily and Carter run a herd of purebred Red Angus cattle under the KC Cattle Co. name.

A Breeder's ... Veterinary Perspective

## Endometritis Research at the Western College of Veterinary Medicine

Improving reproductive performance in dairy and beef herds is a top priority for herd health oriented veterinarians. Postpartum endometritis is one of the many causes of reproductive inefficiency in a dairy herd, and to a lesser extent beef herds, and its true impact is only now being realized with the help of new diagnostic techniques and computerized monitoring of cow productivity. Endometritis is essentially infection and inflammation of the uterine lining. Effects on cow fertility are usually translated into an increase in days open and an increase in services per conception. Other costs associated with this disease may be realized through premature culling, disease treatment, and slowed genetic gain because of fewer calves being born.

Nearly all cows have bacterial infection of the uterus in the first 2 weeks following calving. The perpetuation of infection depends upon the presence of material for the bacteria to feed on, the degree of bacterial contamination and the various uterine defence mechanisms.Throughout the immediate postpartum period the pattern of infection, clearance and re-infection occurs repeatedly, but all harmful bacteria should be cleared within 3 to 4 weeks of calving. Those that are unable to resolve the infection often suffer with endometritis. Up to approximately 15 to 20% of dairy cattle will have clinical endometritis with a further 30% experiencing subclinical disease; however, incidence varies greatly depending on the definition of disease and the herd. In beef cattle, the disease has never been considered seriously despite a single study that showed that approximately 30% of cows may be affected. More studies to determine the impact on beef cow performance are needed.

Clinical endometritis may be thought of as overt signs of disease visible to the naked eye. Because endometritis is so easily confused with normal involution (the process of returning the uterus to its pre-pregnant condition) a great deal of effort has been spent determining what is disease and what is normal. Only within the past 15 years has there been an effort to determine disease status based on retrospective evaluation of the effect on reproductive performance. For the most part, endometritis may be thought of as compromised or delayed uterine involution. As such, clinical signs normally associated with endometritis must be considered in light of the number of days since calving. This has resulted in the current definition of clinical endometritis as the presence of a yellowish or brown uterine discharge visible at the vulva 3 weeks or more following calving. Cows that have had abortions, difficult calvings, retained placentas or are in poor nutritional condition are more likely to exhibit these signs. A key feature of endometritis that producers and veterinarians must realize is that cows with endometritis are not sick – eating, drinking, and the ability to move about are all normal. They may have been sick earlier, within 10 days to 2 weeks of calving with a more serious uterine infection, or they may be suffering from another ailment but endometritis itself does make cows sick.

The term subclinical endometritis was born out of the consideration of endometrial inflammation at the microscopic level. Although signs of disease are not obvious to the naked eye animals with subclinical disease can experience impairment of reproductive performance that is no less severe than with the clinical form of the disease. Subclinical and clinical endometritis should be thought of as a continuum of disease rather than two distinct conditions with no more or no less of an effect on reproductive performance. White blood cells are the first and most significant inflammatory cell involved in endometritis, but of course are also involved in the involution process. In large numbers, what might be best described as armies, white blood cells become visible to the eye as pus. To facilitate diagnosis, threshold proportions of white blood cells have been determined based on the time after parturition and evidence of reduction in reproductive performance. A number of studies have been conducted in dairy cattle to define subclinical endometritis and to determine its impact of reproduction. One of the best diagnostic tools is a small brush attached to a modified artificial insemination (AI) gun that can obtain cellular samples directly from the uterus. Ultrasound may also be useful for detecting more obvious disease but is not that great for diagnosing subclinical endometritis.

Although less common, endometritis may also occur following AI particularly if cleanliness is not maintained.

Over the last couple of years my colleague and I have been studying inflammatory cytokines – chemicals produced by the body's own cells that will either enhance or down regulate inflammatory processes. Very recent work has shown that cows that go on to develop endometritis a few weeks later may be producing an abundance of a different set of cytokines from those animals that remain healthy and normal. We hope that new knowledge out of our lab will lead to better prevention and treatment programs.

Treatment of endometritis has included uterine infusion of antibiotics and short-cycling (inducing heats with prostaglandin products). Both have been modestly effective. Time helps a great deal in restoring uterine health, but may result in prolonged calving intervals. Development of antibiotic resistant bacteria through misuse and overuse of antibiotics must be an important consideration for all beef producers so please consult with your vet concerning use of antimicrobials in your herd.