

# Poster Session

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## Ovarian Responses to Treatment of Non-Lactating Cycling Holstein Cows with a Combination of Progesterone and Either GnRH or Oestradiol Benzoate, Injected at Diestrus

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### Introduction

Re-synchrony is a relatively new concept that has been used in whole-herd controlled breeding program or in regimes developed for treatment of anovulatory anestrus (AA) in dairy cattle. It involves the re-insertion of a used or new intravaginal progesterone-releasing device (IVP4) 12 to 14 days after the first insemination. Progesterone alone is known to alter follicular development of the dominant follicle. The effect may be limited to reduction of growth of the dominant follicle or sometimes an early emergence of the next follicle wave. Injection of a small dose of estradiol benzoate (ODB) at the time of re-insertion of the IVP4 consistently altered the follicular wave pattern, and this was the basis for its inclusion into re-synchrony programs. Injection of ODB at the time of CIDR device re-insertion, as well as at device removal, is the currently recommended treatment protocol.

Conception rates to an induced estrus are influenced by stage of development of the dominant follicle when treatment progestagens have been initiated, being lower when the IVP4 is removed when the follicular wave has just emerged. It is therefore vital that re-synchrony hormonal treatments take account of wave emergence so there is less variation in stage of development of the ovulatory follicle at the time of IVP4 withdrawal.

An alternative to injection of ODB at the time of IVP4 re-insertion is the administration of GnRH. The advantage of GnRH is that it can increase conception rates to the preceding insemination, which has often been found to be low. However, if GnRH is to be incorporated into re-synchrony protocols, it must not only increase conception rates to the first service, but must also re-synchronize cows that return for a second insemination.

The current experiment investigated follicular, CL and ovarian hormonal dynamics after treatment of non-lactating, cycling dairy cows with GnRH or ODB at CIDR® re-insertion on day 13 of the oestrous cycle. The objective was to determine which method of re-synchronization provided more precise follicle emergence, onset of estrus and ovulation. It was hypothesised that GnRH would cause luteinization or rapid suppression of the dominant follicle, earlier and less variable emergence of the ovulatory follicle, thereby resulting in a more precise and least variable onset of oestrus compared to cows treated with ODB.

### Materials and Methods

Non-lactating, cycling Holstein cows (n=25) were randomly allocated to one of the three groups: control (n=7), estradiol benzoate (ODB, n=8) and GnRH (n=9). Every cow was pre-synchronized by insertion of an intravaginal progesterone-releasing device (IVP4) for eight days. Each cow was treated with 2mg ODB intramuscularly (IM) at the time of IVP4 device insertion. On day 13 (where day 0 is the day of oestrus), every cow was treated IM with 500 mg of PGF2a. The IVP4 was withdrawn from the vagina of each cow on day 12. Estrus was monitored from day 12. Ovarian structures were sequentially examined daily by transrectal ultrasonography from day 10 until the day after the next ovulation. Plasma samples were collected every other day from day 10, except on day 13, when plasma samples were collected from 13 catheterized cows (four cows per treatment group). On day 13, a used IVP4 was randomly re-inserted into the vagina of each cow. In addition, every cow in the ODB group was treated IM with 1mg ODB, and those in the GnRH group were each treated im with 250mg of GnRH, while cows

in the control group received no additional treatment. Every cow in the trial was treated IM with 500mg of PGF2a on day 20. The second IVP4 was withdrawn from the vagina of each cow on day 21, followed by estrus detection.

### Results

Mean interval from IVP4 device withdrawal to onset of estrus, total number of mounts and duration of estrus were similar between the three groups (44.6±3.1 hours, 24.4 ± 8.6 mounts and 9.5 ± 1.1 hours for interval from IVP4 withdrawal to onset of estrus, total number of mounts, and duration of oestrus, respectively;  $p>0.31$ ). Every cow in the GnRH or ODB group had three follicular waves, compared to only one of the five cows in the control ( $p<0.001$ ). Six cows in the GnRH group formed accessory CLS after treatment, compared to none of the cows in the control and groups ( $p=0.02$ ). Emergence of a new follicular wave occurred on day 15.1±0.4 in the GnRH group, while those of control or ODB groups

emerged on day 16.6 ±0.9 and 17.5±0.5 days, respectively ( $p=0.02$ ). Maximum diameter of the ovulatory follicles of cows in the three groups did not differ (15.0 ±0.8, 15.3 ± 1.2, 14.5 ±0.6 mm for control, GnRH and ODB groups, respectively  $p=0.83$ ).

### Significance

In summary, treatment of cycling cows with GnRH or ODB at the time of CIDR device insertion during diestrus (day 13) caused follicular turnover and a synchronized emergence of a new follicular wave. This follicular wave emerged earlier in GnRH than in ODB-treated cows. Following the synchronized emergence of a new wave, there was a synchronized onset of estrus and ovulation. The onset of estrus and ovulation were not influenced by treatment. ODB caused atresia of every second dominant follicle, while GnRH could not consistently ovulate this second dominant follicle. The inability of GnRH to consistently cause follicular turnover may be a limitation to its use.

## Re-examination of the Etiology of Fatal Undifferentiated Fever/Bovine Respiratory Disease

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### Introduction

Prevention and control of undifferentiated fever (UF)/bovine respiratory disease (BRD) in Canadian feedlots remains an important component of optimizing the cost of production. Current prevention and control strategies for UF/BRD are directed towards the common etiologic agents involved in UF/BRD of feedlot calves that are described in the veterinary literature. A variety of diagnostic tools, including bacterial and viral culture and serology, have been used over the years to establish that the described etiologic agents are involved in UF/

BRD of feedlot calves. Recent diagnostic developments, such as immunohistochemistry (IHC), allow for more standardized and potentially more sensitive diagnostic detection methods. Previous studies have been conducted using IHC to determine the etiologic agents involved in feedlot mortality. However, general extrapolation of the results from these studies has been limited because of sampling methods used (ad hoc or convenience sampling), populations studied (usually animals with chronic disease), pathologic lesions sampled (a wide variety of multi-systemic diseases) and the confirmatory approach to IHC use (IHC used to con-