

# Comparison of 4-day vs 5-day controlled internal drug release (CIDR) + timed artificial insemination protocols in dairy heifers

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## Introduction

Previous studies have demonstrated that during the application of a 5-day CIDR + Timed Artificial Insemination (TAI) protocol in dairy heifers, the initial GnRH at CIDR insertion and the second PGF2 $\alpha$  12 h after CIDR removal are not essential to optimize pregnancy at TAI (P/TAI; *J.Dairy Sci* 2011 94:4997-5004). A major factor limiting the development of these programs in dairy farms is to overlook the importance of applying the hormonal injections at the correct day and time according to the specific protocol. This situation becomes more critical when trying to avoid cattle management practices during weekends. The establishment of a 4-day CIDR+TAI protocol performed on a Monday-Friday schedule would simplify the routine reproductive management of heifers in dairy farms, since it would facilitate treatment administration (Monday: CIDR insertion; Friday: CIDR withdrawal+PGF2 $\alpha$ ; next Monday: GnRH+TAI). Moreover, in contrast to the 4-day CIDR protocol, both the 5-day and 7-day CIDR programs require handling of animals on three different days of the week. In a recent pilot study heifers treated with a 4-day CIDR+TAI protocol showed an optimal P/TAI (66.7%, 10/15) similar to that observed in the of 5-day CIDR+TAI protocol (46.7%, 7/15) or AI after PGF2 $\alpha$  injection and heat detection (46.7%, 7/15). However; despite the numerical differences, in that study the sample size was not sufficient to show statistical differences among groups. The objective of this study was to evaluate the P/TAI in dairy heifers treated with a Monday-Friday 4-day CIDR+TAI protocol compared to that of heifers treated with a 5-day CIDR+TAI protocol.

## Materials and Methods

One hundred twenty, 12-14 month old Holstein heifers were randomly assigned to one of the two

treatment groups. Group 1 heifers, *Monday-Friday 4-day CIDR+TAI* (Short-Synch, n = 60), received an intravaginal CIDR insert (Eazi-Breed CIDR®, Zoetis Animal Health) containing 1.38 g of progesterone for 4 days. At the day of CIDR removal 25 mg of PGF2 (5 mL Lutalyse® Zoetis Animal Health) was injected intramuscularly (IM); 72 h after CIDR removal, heifers received 100  $\mu$ g of GnRH (2 mL Factrel®, Zoetis Animal Health) IM and TAI. Group 2 heifers, *5-day CIDR+TAI* (Control, n = 60), received the intravaginal CIDR insert for 5 days. On day 5, CIDR was removed and 25 mg of PGF2 $\alpha$  were given IM; 72 h later, heifers received 100  $\mu$ g of GnRH IM and TAI. Heifers were AI by an experienced technician, using conventional frozen-thawed semen from a single sire. Animals were on pasture with access to portable shades and trees and fed a ration once daily that met or exceeded the nutritional requirements of Holstein heifers. Pregnancy diagnosis will be performed by transrectal ultrasound 32 days post AI. Data will be analyzed using PROC LOGISTIC and Chi-square test of the Statistical Analysis System (SAS®).

## Results

Based on our preliminary results, it is expected that heifers treated with the 4-day CIDR+TAI protocol show an optimal P/TAI similar to or higher than that observed in the of 5-day CIDR+TAI group.

## Significance

In conclusion, the Monday-Friday 4-day CIDR+TAI 'Short-Synch' protocol would result in adequate P/TAI in dairy heifers, similar to or higher than that of 5-day CIDR+TAI protocol. This protocol might represent a promising hormonal treatment for TAI in dairy heifers, facilitating their reproductive management routine, while maintaining an optimal fertility.