

Non-inferiority randomized field clinical trial of two GnRH commercial products used in a systematic double-ovsynch protocol at first breeding in dairy cows

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Introduction

The use of the double-ovsynch (DBLOV) protocol at first service in dairy herds has become more popular in dairy practice because of its potential to increase the conception risk (CR), especially in primiparous cows, compared with usual ovsynch or presynch protocols. The use of the DBLOV protocol implies giving four injections of commercial GnRH products to each cow. Previous studies have raised issues about the efficacy of GnRH hydrochloride (Factrel[®], Zoetis Animal Health) to induce ovulation compared with other GnRH forms. However, few studies have reported CR when using the DBLOV protocol in a large number of dairy cows under field conditions. The objective of this study was to compare CR at first service when using GnRH hydrochloride (Factrel[®]) or GnRH acetate (Fertiline[®], Vétoquinol) in a systematic DBLOV protocol in dairy cows under field conditions. The hypothesis was that there would be no significant difference between first-service CR between both GnRH forms.

Materials and Methods

Commercial dairy herds from two veterinary clinics in Québec were enrolled to recruit a targeted sample size of 2,500 cows based on not finding a difference greater than 7% between first service CR after DBLOV protocol using two different forms of GnRH, when considering alpha and beta errors of 0.05 and 0.10, respectively. All cows from participating herds that were above 33 days in milk at the time of the herd health visit were systematically enrolled on a DBLOV protocol for first service. Cows were randomly assigned to receive either Factrel[®] or Fertiline[®] in their protocol when GnRH injection was needed. Reproduction performance at first service and peripartum health events of all cows were recorded over a 14-month period. Cows were examined for pregnancy

diagnosis by transrectal palpation or ultrasound during regular herd health visits. Logistic regression models were used to compare CR of GnRH products accounting for the random effect of herd. Predictors of CR and their interaction with GnRH variable ($P < 0.10$) were tested as fixed effects: parity (PAR; primiparous vs multiparous), breeding season (BS), and recording of retained placenta or metritis (RPME). The reduced model was obtained after deleting all variables that did not qualitatively change the odds ratio (OR).

Results

A total of 2,620 cows from 40 herds were recruited in this study (mean = 65 ± 46.2 cows/herd) and the average parity of these cows was 2.4 (± 1.48). The DBLOV protocol started on average at 38 days in milk (± 4.6). The first service CR of Factrel[®] and Fertiline[®] DBLOV protocols were 40.4% (n = 1,328) and 41.0% (n = 1,292), respectively. Results were similar for each practice site. Interactions were not significant and OR of GnRH were similar in the complete and reduced models. Therefore, in the logistic regression model accounting for the effect of herd clustering, OR of GnRH variable was 0.98 (using Factrel[®] as referent; 95% confidence interval: 0.84-1.16; $P = 0.84$). In a different model, CR was higher ($P < 0.01$) in primiparous cows (48.7%; n = 850) compared with multiparous cows (36.9%; n = 1770).

Significance

Although previous physiology studies have shown that GnRH hydrochloride had a slightly lower ovulation risk compared with other GnRH forms, there was no difference in CR between Factrel[®] and Fertiline[®] when used in a DBLOV protocol at first service in this study. Further research could focus on determining if this finding is true for other ovulation synchronization protocols.