

Cyclase as diluent for Novormon eCG

Objective

To evaluate the effect of using Cyclase as the diluent for Novormon eCG on day 7 of a GPG - progesterone treatment program for non-cycling dairy cows in NZ.

Background

Equine chorionic gonadotropin (eCG) is understood to have an FSH and LH effect on the developing follicle during a progesterone treatment program in anoestrous cows. This effect has been shown in NZ non-cycling dairy cows to improve set-time artificial insemination (STAI) rates and 28 day pregnancy rates by 6 - 7% when cows are treated with 400IU of eCG.^{1,2}

Current treatment programs for anoestrous dairy cows in New Zealand involve 7 days of progesterone therapy in combination with a GnRH-PG-GnRH program. Generally 400IU of eCG is included in these programs as an additional injection given on day 7 of the program, administered at the same time as prostaglandin injection and removal of the progesterone insert (refer to DIB-Synch Plus program in Figure 1).

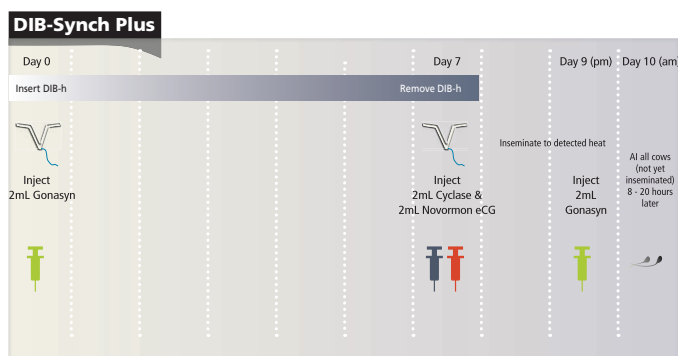


Figure 1. Current non-cycling cow treatment program

This study sought to determine the suitability of using Cyclase (cloprostenol) as the diluent for reconstitution of Novormon eCG. Both products are administered on day 7 of a GPG + progesterone treatment program for non-cycling NZ dairy cows. To aid administration convenience, speed and dose compliance, it was hypothesised that the treatments could be given together as a single injection, rather than two separate injections. Initial laboratory testing showed that both ingredients retained their potency after mixing in the same vial.

Method

A total of 792 non-cycling cows from 12 seasonally calved herds from throughout New Zealand were enrolled in the study. Cows were tail-painted 35 days prior to the planned start of mating (PSM). Dairy cows with no detectable oestrus over the next 25 days were subsequently enrolled 9-10 days prior to PSM.

All enrolled cows underwent an anoestrus treatment program of 10 days in length. Cows were randomly assigned to one of two treatment groups. One group as pictured in Figure 2 (n = 394) was treated on day 7 of the non-cycler treatment program with the combined Cyclase and Novormon eCG at a dose of 2mL (to provide 500µg cloprostenol, and 400IU eCG), and the other group of cows DIB-Synch Plus, as pictured in Figure 1 (n = 398) were treated with 400IU eCG (2mL Novormon) reconstituted with its sterile water diluent and 500µg cloprostenol (2mL Cyclase) administered as separate injections.

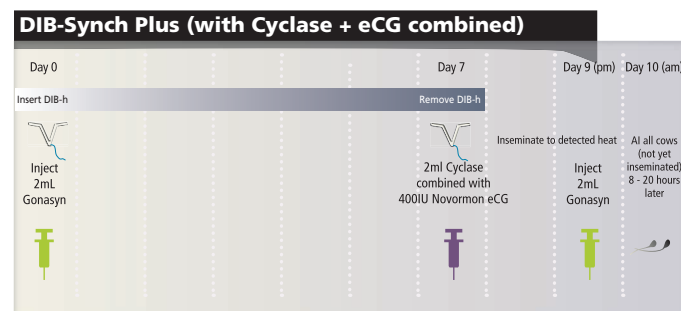


Figure 2. Non-cycling cow treatment with Novormon eCG and Cyclase combined

At the end of the treatment program, cows were inseminated to detected oestrus, or at STAI 8 - 20 hours after the final injection (whichever occurred first). Pregnancy testing providing foetal aging occurred around 12 weeks after PSM, and day of pregnancy and final pregnancy diagnosis were recorded. Pregnancies were assigned to recorded AI events.

Results

As shown in figure 3, the study showed equivalent reproductive performance in both groups of cows, whether administered as a single combined injection, or as separate 2mL injections of Novormon eCG and Cyclase.

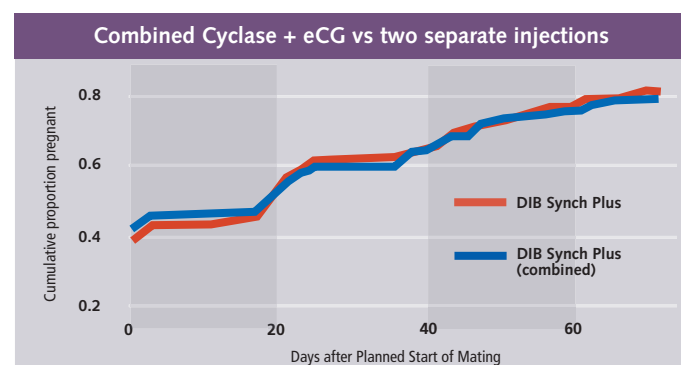


Figure 3. Cumulative proportion of cows pregnant over time following STAI

The group of cows injected with Novormon eCG with Cyclase used as the diluent (combined) had equivalent pregnancy outcomes

compared to Novormon eCG and Cyclase administered as two separate injections. Results were as follows: STAI (41.9% vs 39.3%, $P = 0.45$), 4 week in-calf rate (59.2% vs 62.0%, $P = 0.41$) and 6 week in-calf rate (66.2% vs 67.2%, $P = 0.68$).

Conclusions

This non-cycler cow study demonstrated equivalent pregnancy rates when Cyclase is used as the diluent for Novormon eCG, compared to Novormon eCG reconstituted with the supplied sterile water diluent, and Cyclase administered separately.

Laboratory studies have shown potency and activity of eCG and cloprostenol is maintained when Cyclase is used as the diluent for Novormon, and used either on the same day as mixing and up to 21 days, stored in refrigerated conditions.

Novormon eCG can be mixed following label directions, with either the sterile water or Cyclase as the diluent, with equivalent pregnancy outcomes in typical NZ anoestrous cow programs.

Using Cyclase as the diluent allows one less injection on day 7. It reduces the complexity of the program and assists with dose compliance.

Acknowledgments

Thank you to the Veterinarians and support staff in practices involved, the farmers and their staff, Harold Henderson of AgResearch for statistical analysis, and support from manufacturer Syntex S.A.

This study was conducted under the approval of the Ruakura Animal Ethics Committee, number 13662.

Cyclase and Novormon eCG are Restricted Veterinary Medicines, registered to AgriHealth NZ Ltd, ACVM numbers A10490 and A10641.

References

1. Shephard, R. Efficacy of inclusion of equine chorionic gonadotrophin into a treatment protocol for anoestrous dairy cows. *NZVJ*, 2013, 61:6, 330 – 336.
2. Bryan, M., Bo, G., Mapletoft, R.J., Emslie, FR. The use of equine chorionic gonadotropin in the treatment of anoestrous dairy cows in gonadotropin releasing hormone/progesterone protocols of 6 or 7 days. *J Dairy Sc.* Vol 96, No 1, 2013. Page 122 – 131.