

## Comparing reproductive programs in NZ dairy herds

The September issue of *Vetscript* featured the first article outlining a recent large-scale clinical trial undertaken by AgriHealth in New Zealand during Spring 2010. This second article provides more information about the significant response observed from programmes including equine chorionic gonadotropin (eCG) along with data regarding the impact of the DIB-V device on vaginal health (vaginitis and purulence) of New Zealand dairy cows.

To recap, over 2,000 non-cycling cows from 15 commercial dairy herds across New Zealand were enrolled in the Spring 2010 Study. Cows showing no visible oestrus at ten days prior to the start of mating were randomly assigned to one of four treatment groups:

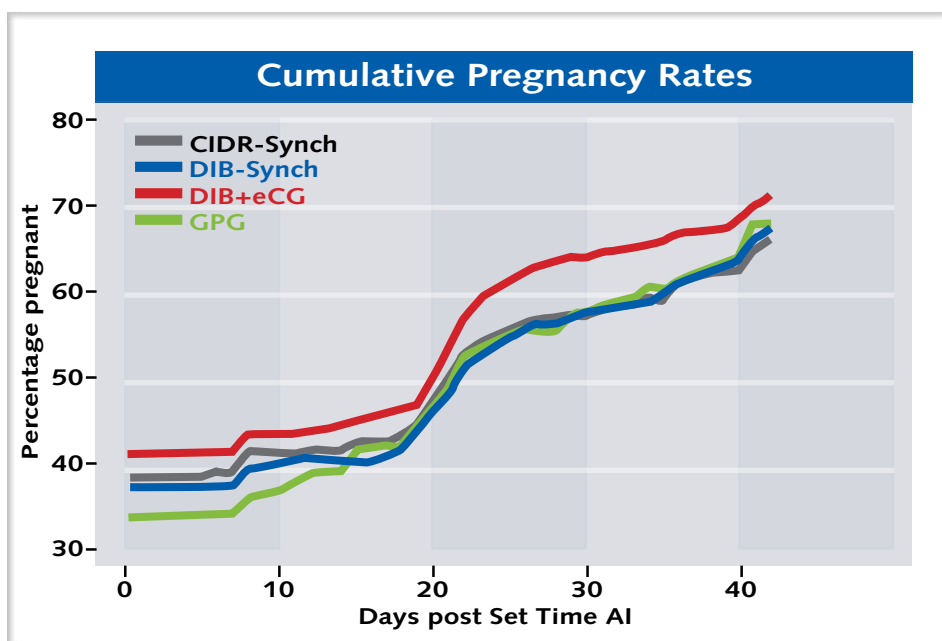
1. CIDR-Synch (CIDR + GPG)
2. DIB-Synch (DIB-V + GPG)
3. DIB-Synch +400IU eCG
4. GPG (ovsynch)

The Study proved the new DIB-V intravaginal insert (containing 1g progesterone) was efficacious and resulted in equivalent pregnancy rates to those obtained by CIDR (containing 1.38g progesterone).

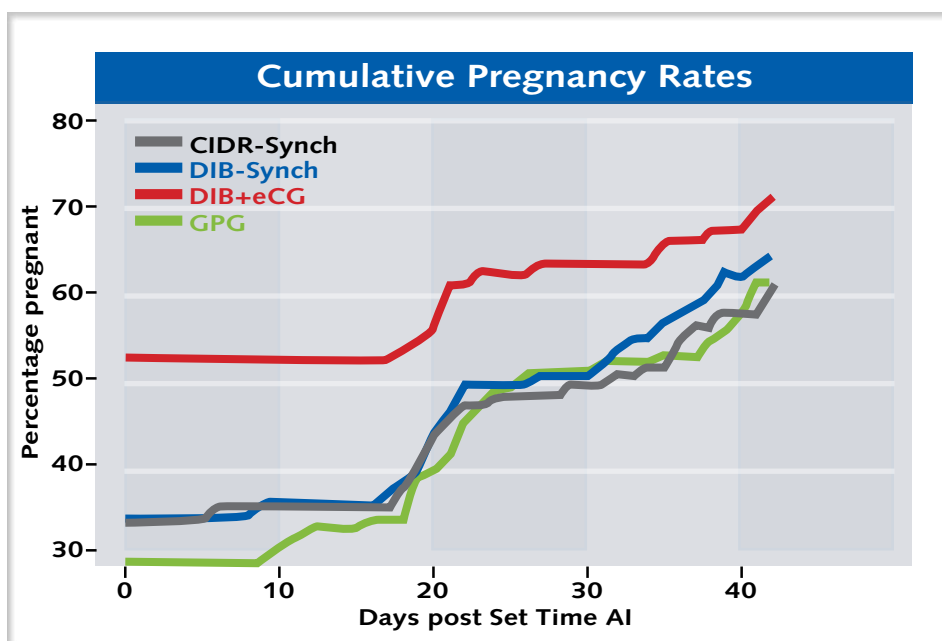
The Study also confirmed the positive effect of eCG (equine chorionic gonadotropin) when added to non-cycling cow programmes. Cows that received 400IU eCG at the time of DIB-V removal trended to higher pregnancy rates to set time insemination (STAI) and had significantly higher pregnancy rates ( $p < 0.05$ ) at 4 weeks after STAI (refer to graph 1 opposite).

Of particular note, the eCG effect was highly significant in the 2 year old age group (refer to graph 2). Although this age group only made up 19% of the enrolled cows (approx 100 cows per treatment group), the effect of eCG was significant at STAI when compared with both CIDR-Synch or DIB-Synch ( $p=0.03$ ) and also GPG (ovsynch) ( $p=0.002$ ).

eCG has been shown to increase follicular development in anoestrus cows resulting in more viable follicles, culminating in ovulation of a slightly larger follicle. This



Graph 1. Cumulative conception curve by treatment group - all non-cycling cows



Graph 2. Cumulative conception curve by treatment group - 2 year old dairy cows

occurs via the effect of eCG on the LH and FSH receptors of the forming follicle. In addition, eCG tends to cause an increase in luteal volume and function which results in improved production of progesterone. The progesterone produced by the corpus luteum after ovulation is responsible for maintaining the pregnancy.

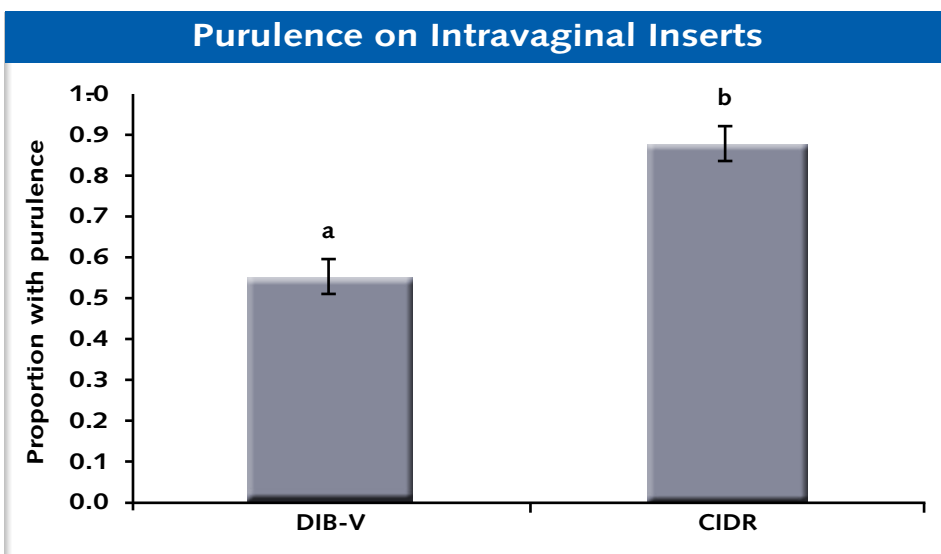
Finally, a more effective endocrine feedback mechanism is understood to be partially responsible for the significant lift in 28 day pregnancy rates. It is believed the stronger luteal function produced by the eCG effect results in fewer 'phantom' pregnancies as cows are more likely to 'return' and ovulate at 18-24 days if conception does not occur at the initial ovulation.

In addition, a further clinical Study by Dr Scott McDougall of Cognosco, Morrinsville was conducted to investigate the prevalence of vaginitis and the degree of purulent material on two intrauterine progesterone releasing devices. There were 220 DIB-V treated cows and 110 CIDR treated cows enrolled in this Study. At the time of removal (following a standard 7 day progesterone based program) the amount of grossly evident purulent material on the device was scored on a 0 to 2 scale. Secondly, the vaginal wall was examined (by vaginoscope) and the vaginal wall was scored 0 to 2 according to the level of inflammation visually observed.

## Clinical Relevance

A large scale clinical study undertaken by AgriHealth on commercial New Zealand farms across the country, replicating standard farming practices for non-cycling cows, provided the following information for New Zealand cattle vets:

1. DIB-V is now proven in New Zealand dairy cows to deliver equivalent efficacy to traditional inserts used in modern 7 day progesterone based programmes.



Graph 3. Proportion of devices with purulence

The proportion of devices with purulence was significantly lower ( $p < 0.001$ ) for the DIB-V compared with CIDR (refer graph 3 above). There was significant herd by herd interaction. Purulence score was highest on devices withdrawn from those cows calved longest. The degree of purulence was not associated with conception rate to first service, having adjusted for age and days in milk.

Less than 10% of cows had any degree of vaginal mucosa change. All lesions were minor, with some limited erythema present. No cow scored higher than 1 on the vaginitis scale or had significant erosions of the vaginal mucosa. There was no apparent associations between vaginal score and first service conception rate.

Farmers who had non cycling cows enrolled in Study were surveyed about their perceptions of the DIB-V. Overwhelmingly farmers reported a preference to the DIB-V device over traditional progesterone inserts. Consistently the NZ dairy farmer feedback was that cows with DIB-Vs had reduced straining and tail flicking and defecated less during milking. There was a general perception that the DIB-V improved cow comfort as cows exhibited more normal behaviour compared with intravaginal inserts used in previous years. Of farmers who used the product in non-cycling cows in 2010 and were surveyed, 80% intended to maintain use of the DIB-Vs in 2011, whilst 20% had no preference which progesterone inserts were used.

2. The addition of eCG improved pregnancy rates in New Zealand non cycling dairy cows compared with other reproductive hormone programs. eg 4 week pregnancy rates significantly increased, by 8%, vs CIDR-Synch or DIB-Synch.

3. eCG treatment also significantly improved pregnancy rates for 2 year old dairy cows for the initial ovulation (day 1 pregnancy rate was 18% higher).

4. The DIB-V device was demonstrated to have superior lodgement in the

vagina at the time of application (not inadvertently removed when applicator withdrawn), along with excellent retention rates in all cows of varying ages and sizes.

5. No significant vaginitis or vaginal irritation, and a reduction in purulence compared with CIDR inserts.

6. Farmers perceived that DIB-V devices were more comfortable for the treated cows (including less straining and tail flicking while in the milking shed).

DIB-V is a veterinary medicine, registered pursuant to the ACVM Act 1997, No. A10319. CIDR, a trademark of Pfizer Animal Health, is a veterinary medicine, registered pursuant to the ACVM Act 1997, No. A04559. Acknowledgements to Syntex SA for supplying the DIB-V devices, eCG, GnRH and cloprostenol.