# SUPEROVULATORY RESPONSES IN CATTLE PRE-TREATED WITH ESTRADIOL AND PROGESTAGEN

P.J. Broadbent, F.E. Gebbie, D.F. Dolman, R.G. Watt, M.E. King and L.C. Higgins
Scottish Agricultural College, 581 King Street, Aberdeen, AB9 1UD, UK

Superovulatory response has been shown to be improved if gonadotrophin treatment commences on or 1 d before wave emergence and treatment with estradiol-17β in the presence of circulating progestagen has been shown to synchronise the emergence of a follicular wave in cattle. The superovulation protocol used in recent years at this centre, however, involves administering estradiol benzoate simultaneously with an intravaginal source of progestagen at Day 7 (estrus = Day 0) of a reference estrous cycle and commencing gonadotrophin treatment 9 d later, which may not be synchronous with the emergence of a follicular wave. These protocols were compared in two trials.

Purebred Simmental nulliparous heifers, 17 to 22 mo old, were superstimulated using either a standard or treatment protocol. Each protocol was applied to 16 heifers in trial 1 and 9 heifers in trial 2. On Day 1 (Day 7 of a reference estrous cycle) of the standard protocol, an intravaginal progestagen device was applied (CIDR-B; SmithKline Beecham, UK) and 10 mg estradiol benzoate injected im (Intervet, UK); gonadotrophin treatment began on Day 10; 30 mg luprostiol was injected im on Day 12; the CIDR-B removed on Day 13; with fixed-time AI at 1500 and 0900h on Days 14 and 15, respectively; and embryo recovery on Day 21. In the treatment protocol, estradiol benzoate was not used but 1 d after CIDR-B application 5 mg estradiol -17β (Sigma, UK) was injected im. Gonadotrophin treatment commenced 4 d later. Subsequent events were as for the standard protocol at the same time intervals after gonadotrophin treatment. The gonadotrophin used was a total of 9.0 mg oFSH (NIADDK-oFSH-17 equivalent; Ovagen, ICP, NZ) administered in declining doses twice per day over 4 d except for the treatment group in trial 1. In this trial, 1500 IU eCG was administered to treatment animals as a single im injection. Data were analysed using Generalised Linear Model procedures within the Genstat statistical package and are presented in Table 1.

Table 1. Superovulatory responses (mean ± SEM) in cattle pre-treated with progestagen plus estradiol benzoate (EB) or estradiol-17β (E-17β)

| | Trial 1 | | Trial 2 | |
|---|---|---|---|---|
| | EB (FSH) | E-17β (eCG) | EB (FSH) | E-17β (FSH) |
| Heifers | 16 | 16 | 9 | 9 |
| CL | 16.4±1.89 | 9.9±1.13 | 15.2±2.19 | 12.6±2.97 |
| Total ova/embryos | 10.1±1.79 | 8.9±1.57 | 10.7±2.15 | 9.8±2.49 |
| Usable embryos | 5.3±1.09 | 4.7±1.29 | 4.9±1.55 | 4.2±1.23 |
| Grade 1 embryos | 4.3±0.84 | 3.8±1.24 | 4.3±1.36 | 3.7±1.32 |

There were no significant differences between the 2 superovulatory protocols except for the number of CL palpated in trial 1 ($P<0.01$) which may have been a gonadotrophin effect. The standard protocol was shown previously to give satisfactory results because estradiol benzoate suppressed the dominant follicle but it may also have synchronised gonadotrophin treatment with the emergence of a new follicular wave. We conclude that the protocols were equally efficacious in promoting superovulatory responses but that the treatment protocol is more convenient.