EGG TRANSFER IN THE COW: PREGNANCY RATE AND EGG SURVIVAL

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Apart from the results reported by Rowson, Moor & Lawson (1969), Rowson, Lawson & Moor (1971) and Rowson, Lawson, Moor & Baker (1972), no data are available on pregnancy rates following the surgical transfer of fertilized cow eggs. Rowson *et al.* (1969) recorded a pregnancy rate of 91% in a group of eleven heifers, each of which received either two or three fertilized eggs transferred to the uterine horn adjacent to the ovary carrying the corpus luteum. No incidence of twinning was recorded following these transfers. Rowson *et al.* (1971) reported a twinning rate of 50% following the transfer of one fertilized egg to each uterine horn in eighteen recipients. The total egg survival in this study was 61.1%. When both the donor and recipient were in oestrus on the same day, however, the corresponding rates were 71.4% and 78.6%. The necessity for close synchronization to achieve high pregnancy rates was again shown by Rowson *et al.* (1972) when they reported a pregnancy rate of 91.1% following transfers where the donor and recipient came into oestrus on the same day. This pregnancy rate fell to just over 50% when the donors and recipients were out of phase by 1 day. Studies are in progress to determine some of the factors which affect the outcome following the surgical recovery of fertilized eggs from donor animals after superovulation and the transfer, both surgical and non-surgical, of one fertilized egg to each uterine horn in recipient animals. This communication deals with pregnancy rate and egg-survival, following surgical transfers in heifers.

Superovulation was induced in donor animals (Hereford cross heifers, 290 to 382 kg) either by (1) intramuscular injection of 2500 i.u. PMSG (Intervet) on Day 16 of the oestrous cycle and intravenous injection of 2000 i.u. HCG (Intervet) on the day of oestrus or on Day 21, or (2) by intramuscular injection of 1500 or 2500 i.u. PMSG on Day 10 of the oestrous cycle followed by intramuscular injection of 700 µg prostaglandin analogue 79,939 (I.C.I.) on Day 12 and a further 200 µg on Day 13. Heifers were inseminated in late oestrus either by natural mating or by artificial insemination (frozen semen). Recipients were naturally cyclic heifers found to be in oestrus on the same day (Day 0) or 1 day later (–1) than the donors.

Between 4 and 8 days after insemination, donor heifers were anaesthetized with pentobarbitone sodium, followed by closed circuit anaesthesia using fluothane and oxygen. Entry to the pelvic cavity was made through a mid-line incision. Both uterine horns were flushed through the oviducts and ova were collected through a polyethylene cannula inserted into the oviducts. The

flushing medium used was sterile TCM 199 (Biocult) based on either Hanks or Earles basic salt solution and buffered by either sodium bicarbonate or Hepes buffer. Following flushing into glass collection cups, examination under a stereoscopic microscope was carried out in a specially constructed cabinet at 35°C. Eggs were placed in TCM 199 in an incubator at $37 \pm 1^\circ\text{C}$ and held until transfer.

Recipient heifers were anaesthetized in a similar manner to that used for donors and the uterine horns were exposed through a mid-line incision. One, two or three eggs were then transferred to each recipient. Single eggs were transferred to the uterine horn adjacent to the corpus luteum. Where two eggs were transferred one was placed in each uterine horn. Transfer was carried out by drawing the eggs into a Pasteur pipette and depositing them in the uterine horn approximately 20 to 25 mm from the uterotubal junction. Recipient heifers were either slaughtered at 40 days or palpated at 60 days to ascertain the presence or absence of pregnancy. The results of the transfers in terms of pregnancy rates are given in Table 1.

Table 1. Pregnancy rate following surgical transfers in cattle

Degree of synchronization (days)	No. of recipients	No. pregnant	% Pregnant
0	24	22	91.7
-1	7	5	71.4

The pregnancy rates obtained of 91.7 and 71.4% for synchronous and asynchronous transfers, respectively, are in good agreement with the corresponding values of 91.1 and 52.2% reported by Rowson *et al.* (1972). A total of twenty-three recipients were slaughtered at 40 days to provide data on egg survival rates (Table 2).

Table 2. Egg survival rates following surgical transfers in cattle

Degree of synchronization (days)	No. of heifers killed	Total no. of eggs transferred	No. of embryos (40 days)	% Egg survival	No. of recipients with twins	% recipients with twins
0	16	33	27	81.8	12	75.0
-1	7	10	6	60.0	1	33.3

The data on twinning and egg survival rates obtained in this study are in close agreement with the values, 71.4 and 78.6% respectively, reported by Rowson *et al.* (1971), and confirm the feasibility of achieving high pregnancy rates in cattle following surgical recovery and transfer of fertilized eggs.

Little information is available in the literature on fetal loss in twin-bearing cows or heifers. Gordon, Williams & Edwards (1962) reported a loss of 9.2% following positive diagnosis at 42 days. The data of Rowson *et al.* (1971) suggest a loss of 10% from 42 days onwards. It would appear from this that the

high pregnancy and egg survival rates reported here would sustain approximately a 10% loss up to calving.

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