

TWINNING IN BEEF CATTLE

TWINNING BY NON-SURGICAL EGG TRANSFER IN A SUCKLER HERD

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Currently (June, 1985), two frozen-thawed ova are being implanted in cows of a Hereford × Friesian spring-calving suckler herd in the third year of trials to adapt non-surgical transplant procedures to induce twinning on the farm. Information on the effect on the twin-bearing cow and the potential of twin calves is being obtained. Eggs for transfer were obtained from donor cows and heifers superovulated with PMSG and synchronised with PRID containing progesterone, oestradiol benzoate (Abbott Laboratories, Ltd) and Estumate (ICL, plc) containing prostaglandin. The numbers of viable eggs collected 7 days after AI with fresh Charolais semen were 2.5 and 3.1 in 1983 and 1984, respectively. The recipients were in synchrony with the donors in 1983 and two fresh ova were placed at the base of the ipsilateral uterine horn of recipients 7 days after oestrus, using an insemination gun. In 1984 and 1985, eggs were collected in advance of the breeding season and stored in liquid nitrogen (−196°C). In 1985, the two ova were placed in each plastic semen straw with cryoprotectants; they were implanted after thawing without re-examination.

The number of cows implanted and the progress of developing embryos assessed by progesterone assay of milk (MMB), real-time ultrasonic scan and births, is shown in Table 1. Barren cows were detected by oestrone sulphate blood serum assay at the seventh month of pregnancy but the test did not distinguish single and twin pregnancy.

All cows were fed *ad lib.* silage (61D) during the winter housed period. A fall in the condition of twinning cows occurred about a month before calving and, because a rise in serum hydroxybutyrate was detected, a

TABLE 1
Cows pregnant

Day	Test	1983		1984	
		Twin	Single	Twin	Single
7	Implanted	32	1	59	
21	Progesterone	22	1	37	
84	Ultrasonic scan	15	5	25	10
210	Oestrone sulphate	12	5		
	Parturition. Calves born	24	5	32	12

TABLE 2
Live weight (and condition score) of implanted cows (kg)

	Twins	Singles
Implanting June	530 (3.5)	536 (3.6)
Weaned October	538 (3.5)	522 (3.5)
Calved April	495 (2.8)	529 (3.2)
June	517 (3.1)	557 (3.7)
Weaned October	514 (2.3)	549 (3.2)
December	548 (3.0)	580 (3.5)

supplement of 2 kg barley was fed at 10 p.m. each evening and was increased after calving to 4 kg until turnout to improved upland grazings in April. In the second year, 1.5 and 3 kg of barley were fed. The twinning cows calved during the day time; foetal membranes were not retained but oxytocin was given at calving. The mean gestation was 287 days for single and 282 days for twin births.

In the first year, two twin pairs were aborted, six twins were born without complication, one calf of each of the next two twin births died a week later and a twin pair were born dead. In the second year, one twin pair was aborted, one pair died at birth and one calf of two twin sets died after calving.

A summary of cow live weight and condition change in the first year is given in Table 2.

Despite the low birth weight of twin calves and depressed growth rate indoors, they made excellent progress at grass (Table 3). They were weaned on 4 October in 1984, following a growth check due to a shortage of grass and the condition of their dams. They were turned out to finish at grass in April 1985 on the 18-months system and are unlikely to be more than a week or two later than single calves.

The response to PMSG has been poor, hence the decision to freeze embryos, but an inadequate supply of viable ova will be a major problem unless *in vitro* procedures allow new sources to be developed. Using frozen-thawed embryos, all suitable cattle can be selected since donor synchrony is not needed. A rapid progesterone assay kit is being tested to confirm the suitability of recipients to be implanted.

All except one single and one twin bearing cow

implanted in 1983 calved again in 1984, including three twinning in successive years; it appears that, with extra feed in late pregnancy and adequate grazing, re-breeding will present no difficulty.

The twin calf lighter at birth grows well at grass but

earlier weaning may be necessary. The first group of twins are now finishing on an 18-month system. The ova transfer techniques were carried out by Dr G. Williams, R. Newcombe and I. Kippax of the MMB and their contribution to this work is gratefully acknowledged.

TABLE 3
Growth rate of calves from implanted embryos (kg)

	1983		1984	
	Twins	Singles	Twins	Singles
Birthweight	36	46	35	47
Daily l.w.g. birth-turnout	0.8	1.0	0.8	0.9
Daily l.w.g. birth-weaning	1.0	1.1		
Daily l.w.g. 190-day winter	0.7	0.5		
200-day weight	242	266		