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Brief Communication

OVA TRANSFER IN DANISH BLUE WHITE CATTLE

Surgical recovery and transfer of bovine ova have been attempted for several years, e. g. *Umbaugh* (1951), *Willett et al.* (1953), *Avery et al.* (1962), *Rowson et al.* (1969). This report contains the major results (Tables 2 and 3) from 52 donor and 264 recipient operations.

Table 1. Donor schedule.

Experimental day	Day of oestrus cycle	Treatments
0	9—14	PMSG i.m.
2	11—16	PGF_2Alpha i.m.
4	0 (heat)	ins.
5	1	ins.
9	5	surgical recovery

An outline of the donor schedule is given in Table 1. Superovulation was initiated on day 9—14 of the oestrus cycle of the donor by intramuscular administration of pregnant mare serum gonadotropin (PMSG)*. Three batches were employed and their superovulatory effect varied considerably, probably because of improper purification. Several authors imply that repeated administration of PMSG (antigenic) may stimulate the production of specific PMSG serum antibodies which consequently decrease the effect of the PMSG; our results tend to support this concept. The effect was measured by the number of ovulations, i. e. the number of corpora lutea found at surgery on day 9. It is recommendable to change the batch of PMSG, if an animal shows poor response.

Injection of 25 mg prostaglandin (PGF_2Alpha)** 48 hrs. after the PMSG treatment generally resulted in standing heat within 48 hrs. (42.1 ± 4.9). Donors and recipients were examined for heat 3 times daily. Animals that did not come in proper standing heat were never bred. Heat intensity varied considerably, but was not correlated with the number of follicles.

Frozen semen containing 120 million live sperm per straw

* Antex®; Leo Pharmaceuticals, Ballerup, Denmark, and Folligon®; Intervet Laboratories Ltd., Viking House, Barhill, Cambridge, England.

** Prostin F 2 Alpha Vet., Upjohn Ltd., Flemingway, Crawly, Sussex, England.

was prepared specifically for this purpose. The donor was bred 12—14 hrs. after the onset of standing heat and hence every 12—16 hrs. until cessation of heat. Fifty-seven ova (18 %) were unfertile.

The ova were recovered 5 days after the onset of standing heat. The donor animal was in general anaesthesia and the uterus and ovaries were exposed through a 20—30 cm long midline incision.

Table 2. Results from recoveries and transfers.

	PMSG dose (i.u.)	Number ins.	Corpora lutea		Recovered fert. ova		Recovered unfert. ova		Transferred ova	Pregnant recipients per donor operation
			left ovary	right ovary	left side	right side	left side	right side		
Mean	2770	2.5	5.6	5.9	2.8	3.3	0.6	0.4	5.1	2.6
± s	450	0.3	3.5	3.6	2.7	2.9	0.2	0.1	3.6	1.8
Range	1800—4000	1—4	0—17	2—18	0—11	0—13	0—1	0—5	1—13	0—10

Uterine and/or oviductal flush was done bilaterally using 3 × 20 ml Brinster's medium (BMOC-3)*. The ova were immediately identified and graded under a stereo-microscope. The grades were A, B, C and D, and they were subdivided according to their cell stages: 8, 8—16, 16—32, 32—64. The 16—32 cell stages of A and B ova had the highest pregnancy rate. The ova were stored at 37 °C and transferred to recipients within 6—8 hrs. The recovery rate measures the ratio between the number of recovered ova and corpora lutea, i.e., the number of ovulation points. It was 63 %, varied sizably and reflected the efficiency of the flushing technique. Since the recovery rate decreased significantly at the second and third surgery as opposed to the first time, the surgical way is limited. Adhesions and formation of granulation tissue in the ovarian region account for this.

The fertilized ova were transferred to the uterus of the standing, paravertebrally anaesthetized recipient via flank approach. A Pasteur pipette introduced the ova few cm from the utero-tubal junction. The transfer rate is the ratio between the recovered fertilized ova and the transferred ova, and it was 82.5 %. The number of transferred ova per donor operation averaged 5.1 (1—13) and the pregnancy rate was 51 % assessed by rectal

* Grand Island Biological Co., Grand Island, N. Y. 14072, USA.

Table 3. Results from transfers.

Synchronization (± hrs.)	Number of pregnant animals	Pregnancy rate (%)
0 to — 6	19	38
— 7 to —12	44	51
—12 to —18	28	52
—19 to —32	18	60
1 to 6	18	58
7 to 14	7	58

palpation 6—7 weeks after the transfers. The selection of recipients was ultimately based on the concept that maximized synchronization of recipient and donor heat would result in higher pregnancy rate. Average synchronization for pregnant animals was —8.7 hrs., i.e. the average donor heat preceded that of the recipients with 8.7 hrs. and for nonpregnant animals —7.9 hrs. This difference is not significant. The highest number of pregnant animals was found at the —7 to —12 hrs. synchronization, and this study can not as of now make any definite conclusions to the importance of proper synchronization. The relation between pregnancy and synchronization is given in Table 3.

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Torben Greve and *H. Breth Hansen*
East Jutland Animal Hospital,
Langaa, Denmark.

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Reprints may be requested from: East Jutland Animal Hospital, DK-8870 Langaa, Denmark.