Applications of embryo transfer

- Faster genetic improvement.
- Genetic screening.
- Disease control.
- Import and export.
- Circumvention of infertility.
- Twinning in cattle.
- Conservation of endangered species.
- Research; production of clones and genetic engineering.

Steps Involved In Embryo Transfer

1. Selection of donor
2. Selection of recipient
3. Estrus synchronization of donor and recipient
4. Superovulation of Donor with high quality semen.(release of multiple eggs at a single estrus).
5. Artificial insemination of donor
6. Embryo collection
7. Evaluation of embryo
8. Transfer of embryo / cryopreservation of embryo / Micromanipulation

1. Selection Criteria Of Donor

- Superior individual performance
- Good productive performance of offspring
- Regular cyclicity
- Ovaries must be free (no adhesions)
- Intact tubular genitalia (free from any sort of abnormalities)
- Younger (4-8 yrs. of age)
- Healthy and have good body weight

- Must have calved at least 60 days back (best 90-100 days postpartum)
- Normal postpartum history.
- A history of no more than two breeding per conception.
- Previous calves having been born at approximately 365-day intervals.
- an appropriate body condition score at the time of embryo transfer.

2. Selection Criteria Of Recipient

- Healthy, free from infection and have good body weight.
- Regular cyclicity.
- Intact genitalia (free from any sort of abnormalities)
- Must have good cyclic CL of desired stage at the time of embryo transfer.
- Exhibit calving ease, and that have good milking and good mothering ability.

3. Estrus Synchronization of Donor

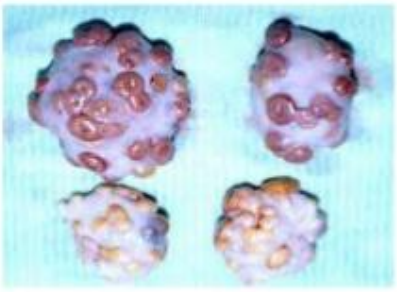
- The donor cow should be synchronized to bring into estrus or should have palpable corpus Luteum in the Ovary to start the Super stimulation procedure.
- For this, any of the synchronization protocol can be used (Lecture on Estrus Synchronization)

4. Superovulation of Donor Cow

Is the procedure for increased ovulatory response by administration of hormones (gonadotropins) to produce several ova instead of one which is normally produced at each estrus.

- This large number of ova is later on fertilized and embryo produced can be transferred to the other females.

- The basic principle of superovulation is to stimulate extensive follicular development through the use of a hormone preparation, which is given intramuscularly or subcutaneously, with follicle stimulating hormone (FSH) activity.



In the ewe, doe and cow, an average of 12 ovulations can be expected. In sows, the number of ovulation could be > 20.

- Superovulation has not yet achieved in Mares due to ovulation occurring at one site of the Ovary (Ovarian Bursa).

Time of Superovulation

- For optimum response gonadotropin treatment is initiated during mid-luteal phase i.e. on days 9-14 (if we consider day 0 as estrus) of a normal estrous cycle.
- Donor cows can be superovulated repeatedly at approximately 6-8 weeks intervals .

5. Insemination Of Donor (A.I)

- Donor should be inseminated artificially 2-3 times at 12 hours, 24 hours and 36 hours interval, beginning at 8-10 after the onset of estrus. This is required because ovulation can occur over an extended time period.
- Fresh semen is preferred.
- If frozen semen- then use double insemination dose at each insemination.

6. Embryo Recovery

Embryo can be collected by following methods;

1. Surgical method
2. Non-surgical method
3. Laparoscopy