

# **MOET (MULTIPLE OVULATION EMBRYO TRANSFER TECHNOLOGY)**

**DR POONAM KUMARI**

**DEPT OF ZOOLOGY**

**M.SC SEMESTER III CC 02**

Multiple ovulation and embryo transfer (MOET) can be defined as a process or steps in removing the fertilised eggs from a female donor and putting them in multiple surrogate recipients, who are not related genetically . This technique can be carried out in a range of farm animals such as cattle, sheep, goat, buffalo and pig except in horses which are not able to be superovulated. Embryo Transfer (ET) is an effective method of increasing the reproduction rate of individuals or groups of animals.

All female animals are capable of producing far more eggs than they ever need over their lifetime. ET uses Follicle Stimulating Hormones (FSH) to cause the ovaries to release more than one egg in a cycle. Multiple eggs can then be fertilised inside the cow and collected non-surgically, usually 7 days after mating (or artificial insemination). These embryos can be transferred into surrogate mothers (recipients) who are at the same stage of their cycle but have not been mated. Many of these embryos are accepted by the recipients and a normal pregnancy occurs. Alternatively, embryos can be frozen for sale or later transfer.

## **Drugs Used**

Other than the FSH injections, it is necessary to synchronise animals so that they cycle at the correct time. This is the reason that the programs include progesterone (eg CIDRs), PMSG (e.g. Pregnecol), GnRH (e.g. Receptal) and prostaglandin (eg Estrumate or Estroplan injection).

The ET procedure can be divided into 4 areas.

## **1 Programming**

The donor and recipient cows must have their heats synchronised. Donors require treating with FSH, which needs to be given by injection, twice a day for four days. Recipients also need injecting with Prostaglandin. All injections are to be given into muscle i.e. neck or rump.

IMPORTANT - it is critical to results that cows:

- Are fed well prior to and after calving – they may need preferential management
- Have a sufficient interval after calving – 6 weeks prior to start of program is minimum
- Have cycled
- Have been vet checked to ensure they are clean

## **Heat detection**

Where cows are artificially inseminated it is essential that heats are accurately recorded. Heat detection aids will assist greatly.

## **Embryo Collection**

On collection day donors and recipients need to be handy to the yards, which need to be secure, preferably with a covered race. The donor cow is given an epidural injection to relax her bowel. Her rear end is washed and sterilised. With their (gloved) left hand in the cow's rectum the vet or technician guides a catheter into the

vagina, through the cervix and up one side (horn) of the uterus. An inflatable cuff on the catheter is filled with air to hold the catheter in place and fluid is run into the uterine horn. When the horn is filled with fluid it is run back through the catheter and through a very fine filter. This catches the embryos. After repeating this process several times the catheter is transferred to the other horn of the uterus and the process is repeated. After collection, the cow is released to go back to her paddock. She needs to be given a Prostaglandin injection 3 days after to get her cycling and to remove any embryos that may have been left behind.

### **3 EMBRYOLOGY**

The filter is rinsed into a petri dish and searched under a microscope. Once found, the embryos are counted, graded and washed. The embryos can now be loaded into transfer guns (similar to long AI pistolettes) and transferred into recipients, or frozen. Freezing takes about 2 hours with the embryos held in straws of antifreeze solution and slowly cooled to  $-30$ . They are then plunged into liquid nitrogen and stored indefinitely at  $-190$  degrees C.

### **4 TRANSFER**

Recipient cows are held in the race or head bail, given an epidural and washed. The ovaries are felt to check that the animals have cycled successfully. As with flushing, the transfer gun is inserted into the vagina, passed through the cervix and up one of the uterine horns where the embryo is deposited.

### **Facilities**

Basic yards are needed with a covered race where cows can be securely held for programming and flushing. For embryology, a clean, warm room with power and a

bench is required. This need not be at the yards. We have a van equipped as a mobile embryology lab, which we can use where there is no suitable room or power.

## **CONCLUSION**

Multiple Ovulation Embryo Transfer (MOET), a conventional embryo flush, is the most common procedure used in advanced cattle breeding. It involves a 5 week superovulation program, resulting in several eggs being released from the donor cow, as opposed to one during a natural heat. The cow is inseminated and embryos are then flushed from the cow's uterus the following week. This involves placing a catheter through the cervix and into the uterus, where a cuff is inflated and fluid is flushed in and out to collect the embryos from each horn.

An average flush would produce 5 embryos, additional advantages of this technique are as follows:-

- Increase the reproductive rate of individuals or groups of animals.
- Non-surgical.
- Embryos can be transferred fresh, or frozen in our lab for use later.
- Entire procedure can be carried out on farm.
- Consider 'banking' embryos in case of future TB breakdown.