

# **BOER GOAT EMBRYO TRANSFER Steps to a Successful Embryo Transfer Program**

by Sam Castleberry, DVM

Good management is the cornerstone of any embryo transfer program, and there are no shortcuts. You can't get good management out of a bottle or through a needle, and for that reason, the following information is intended to help you understand what is involved in setting up a basic ET program, what we do, and why. **PLAN AHEAD:** If I only had two words of advice that I could give you about your embryo transfer program, they would be "plan ahead". I almost feel safe in saying that I don't think you can start too early. **AVOID STRESS:** The biggest enemy you will have in any part of your goat operation is stress, which unfortunately is not entirely preventable. Some examples of how stress is induced are:

- Mixing groups or individual animals together that have not previously been together.
- Altering the goats regular routine.
- Handling the goats unnecessarily.
- Confining goats in close or unfamiliar surroundings.
- Causing goats to become frightened, such as exposure to predators

The ease with which your goats can be handled and the avoidance of stress from a period of time before you began an ET period until at least the second month of pregnancy will reflect drastically on your conception rates and ultimately the number of kids born.

**PLAN FOR THE USE OF TEASER BUCKS:** Teaser bucks are one of the most important components of the program. Proper use of these animals can influence your success in a very positive way. Recipients and Donors must be exposed to teasers to initiate heat activity for a minimum of 30 days, and preferably 60 days, prior to beginning a program. I prefer to use vassectomized bucks rather than those which have been deviated, because the vassectomized animals can still penetrate the females which allows for better stimulation.

Donors should be in small groups, and one teaser buck is sufficient. If as a breeder you don't like the aesthetics of an "off breed" animal in the same pen with your donor females, then in most cases nose to nose contact with bucks through a fence is sufficient to induce heat.

With regards to your recipients, I feel that it is important to have teasers with them in a ratio of 1-25, both before you begin a program and during heat detection at mating time. Harnesses with different colored chalk can be strapped to teaser bucks and is helpful in heat detection.

**NUTRITION:** Proper nutrition, as manifested by positive weight gains throughout an ET program, can have a very beneficial result on conception and kidding rates. Depending upon the initial condition of your donors and recipients, at the onset of your preparations for a ET program, a feeding regime needs to be initiated. Ideally, we would like to see your animals in a start condition that would allow for approximately 0.5 lb. of gain per day beginning 30 days prior to start of the program, through 45 days after breeding. Remember, it is very difficult to put weight on a goat that is already fat, and the boers seem to be very easy keepers. Some type of scale or weighing device can be very helpful for monitoring the gain of your pureblood animals and recipients.

**EXAMPLE OF AN ET PROGRAM SCHEDULE:** The following is an example of a programming schedule that we use in a flushing program:

- DAY 0 - Put CIDRS In Recipients
- DAY 1 - Put CIDRS In Donors - Official Start of ET Countdown
- DAY 16 - Donor FSH Injections in AM & PM
- DAY 17 - Donor FSH Injections in AM & PM
- DAY 18 - Donor FSH Injections AM & PM And Recip CIDRS Out in PM
- DAY 19 - FSH Inject. in AM & PM, Donor CIDRS Out in PM & Record Recip Heats
- DAY 20 - Mate Donors in the AM & PM And Record Recipient Heats
- DAY 21 - Mate Donors in the AM And Record Recipient Heats
- DAY 23 - Put New CIDRS Back In Donors
- DAY 25 - Take Both Donors And Recipients Off Feed & Water
- DAY 26 - ET Day: Flush & Lutalyse Donors, And Transfer Embryos To Recips
- DAY 36 - Remove Donor Stitches

As you can see, it is fairly simple process, and one that is relatively easy to follow. The first item is the implanting of your recipients with CIDRS, followed the next day by repeating that procedure for your donors. CIDRS are a synchronization device used mainly in sheep and goats, although they are also used in cattle. They are made of a hard plastic and impregnated with a hormone called progesterone. While the CIDR is in place, progesterone is released into the system of the goat. When the CIDR is removed, there will be a rapid fall in the progesterone level, much in the same way as the progesterone falls during the normal cycle. The other two related hormones, FSH (Follicle Stimulating Hormone) and LH (Luteinizing Hormone) effect growth, maturation, and ovulation of the follicles.

Looking back at the programming schedule, you will notice the FSH injections that the donors receive for superovulation on days 16 to 19. This process consists of eight injections given twice daily for four days., and the dose is dependent upon the age of donor that is being superovulated. Timing of estrus or heat in both the donors and recipients is controlled by CIDR removal. You will notice that the recipient CIDRS are removed 24 hrs. earlier than the donors. The reason for this is that it takes the recipients longer to respond to CIDR removal because of lower estrogen levels when compared to the superovulated donors.

Donors are mated using natural service over an extended period of time because of ovulation occurring over 24-36 hours. Does are mated at 12 hr. intervals beginning at onset of heat and continuing until she will no longer accept the buck. Observe your animals, one ejaculation per breeding is sufficient. Don't overwork your bucks. Do not put a buck with a group of donor does and leave him. He will very likely service only one donor. If you have not been using your bucks regularly prior to beginning a program, you may want to artificially create heat in some extra does to test mate your bucks to be assured that they will work, and/or you may wish to have your veterinarian perform a fertility exam.

The next item on our list is the re-implantation of your donors with another CIDR. We do this to help prevent premature luteal regression. This is a condition where progesterone levels fall and the donor

begins to return to estrus even before she can be collected. By increasing progesterone levels with the CIDR this problem can sometimes be prevented. EMBRYO COLLECTION: We are now ready for the "big day" - collecting the embryos. Our method of collection is surgical using general anesthesia. To help prevent complications that can occur when animals regurgitate, we take them off feed and water the day before surgery to facilitate an empty rumen.

The goats uterus consists of two horns which is referred to as a BIPARTITE. On the day of collection, the embryos are located in the section of the horn of the uterus the most distal from the cervix. The collection is done by literally washing the inside of the uterus with a fluid media in which the embryos become suspended and then searching this fluid aided with the use of a low powered microscope.

After evaluating the superovulatory response of the donor by observing the ovaries through a laparoscope, the horns of the uterus are exposed, one at a time, through a small incision just in front of the udder. Each horn is collected separately, using approximately 40 ml of media for each side. IMPLANTING EMBRYOS: Results from superovulation are varied. Our averages this past season were approximately 8 useable embryos from doe kids and 10-12 useable embryos from adults with the older does working best. With these numbers in mind we try to program 6-8 recipients on kid flushes and 8-10 recipients on adult flushes.

Two embryos are routinely transferred to each recipient with the exception being when there is an odd number of embryos from a given donor. The recipients undergo the same type of general anesthesia as the donors. The ovaries and uterus are examined through the use of a laparoscope. After a recipient has been determined acceptable, a small portion of the uterus is exposed through a small incision in the abdominal wall, and two embryos are injected via a needle puncture into the uterine horn on the same side that ovulation occurred.

The freezing of embryos is a tool that can be used when recipient numbers are short and embryo splitting can be utilized when abundant recipients are available.

Post transfer recipient care is also critically important. The avoidance of stress during this period can influence conception and kidding rates in a positive direction. I would recommend waiting at least 40 days post transfer before scanning for pregnancy or moving goats.

**SUMMARY:** The actual collection and transferring of embryos is only a small part of the entire program, the success of which, as you can see, is dependent upon many small but critical steps. Please pay close attention to all details, and remember that there are no easy shortcuts.

I hope that this information proves to be helpful in your embryo transfer work and in the overall success of your goat operation.

#### About The Author

Dr. Sam Castleberry is a 1975 graduate of Texas A&M College of Veterinary Medicine, and the majority of his career has been devoted to providing embryo transfer services. He formed his own practice, Veterinarian Reproductive Services, Inc. in 1983, and from that date until 1993, his work primarily involved beef cattle. In the fall of 1993 and spring of 1994, Dr. Castleberry worked with Dr. Stuart Southwell of Premier Genetics N.Z. LTD in New Zealand, implanting frozen embryos and flushing Boer goats in order to familiarize himself with that procedure.

Dr. Castleberry is an AETA certified member and operates an AETA approved facility. He has performed embryo transfer services for an international clientele, which has taken him to Mexico, Canada, Japan, England, and New Zealand.

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