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B & D Genetics Sheep and Goat In-Vitro Fertilization (IVF) Program

We want to thank you for selecting us to perform your In-Vitro Fertilization (IVF) program. This packet is a guide of what to expect from our company the day of aspiration and what preparations you need to make to get your donors, recipients, and facility prepared for the day.

The IVF Process

1. **What is IVF?**

IVF stands for in-vitro fertilization. This is a procedure where the oocytes are removed laparoscopically directly from the ovary of a stimulated donor female. The oocytes are then shipped to an IVF lab overnight where they are fertilized in a petri dish with frozen/thawed semen.

2. **What results can I expect?**

A stimulated donor should produce 8-10 oocytes that are high enough quality to fertilize. Of these 10 oocytes you can expect to produce 4-5, grade 1 embryos that will be frozen for later transfer. Results from this procedure are highly variable and we have seen results much higher and lower than the averages stated above. Generally speaking, 20% of donors will consistently produce over 4 embryos per cycle and 10% will produce <4 or no embryos per cycle. Pregnancy rates associated with frozen IVF embryos are lower (50%) when compared with conventionally frozen embryos (70%).

3. **Why would I want to do IVF instead of regular embryo transfer or artificial insemination?**

The IVF process is ideal for donors that could not create or maintain a pregnancy by other means. Oocytes are removed directly from ovary and cultured in a dish. This creates an artificial uterine environment for embryo development. Once embryos grow to an appropriate stage they are then frozen for later transfer. Because techniques are completed laparoscopically donors can also be aspirated every 4-5 weeks, which is much shorter than the 60 days recommended in between flush dates.

IVF is also a valuable tool for sires with a limited quantity of straws remaining. Since oocytes are fertilized in a drop within a dish a much smaller dose of semen is needed. High quality straws can be cut and half used at a time. Semen is “washed” prior to fertilization which allows us to use straws that has a low post-thaw motility.

Generally speaking, half of a cut straw can fertilize 10 donors that produce 10 oocytes each (1/2 straw per 100 oocytes).

4. **Frozen Semen**

Only frozen semen will be used to fertilize oocytes in the lab. We recommend that you have a backup buck (2 more straws from additional buck) in case there is an issue with the straws from the first buck you chose

Justification: Frozen straws can be of lower quality due to injury to the straw due to improper shipping or handling. Quality and/or damage cannot be assessed until straw is thawed and evaluated. If the straws are of lower quality and do not have enough motile cells to fertilize oocytes this will also results in a lower number of or no embryos. Therefore, it is recommended to have additional straws of an alternate buck at breeding. If there are no quality issues, then the backup buck straws will remain in storage and not be used.

5. **Donor and Recipient Programming**

Leading up to collection day your donors and recipients will undergo an estrus synchronization program. Donors will receive a series of injections of follicle stimulating hormone (FSH). This hormone is produce naturally in the body of the animal, however, in an attempt to recover more oocytes, exogenous FSH is given to the donor animals. They will also receive a controlled internal drug releasing device (CIDR) during this same period.

B & D Genetics does offer synchronized recipients for IVF transfers upon customer request and are on a first come, first serve basis. B & D Genetics is able to transfer IVF embryos on your farm using recipients that you have programmed. We are not able to aspirate donors on farm at this time.

The recipients are only used for transfers and will receive a CIDR and only two hormonal injections, lutalyse and PG 600. FSH and PG 600 are shipped as dry products that are rehydrated (mixed) prior to use. Once mixed they must be stored in the refrigerator to maintain their potency. Please refer to FSH and PG600 mixing instruction PDFs for more information. These hormonal injections are given in order to synchronize the recipients and donors heat cycles/ovulation for embryo transfer. Recipients heats must be checked and recorded every 12 hours. Only recipients that were in heat 24 hours prior to or after the donor will be used.

6. Licensed Veterinarian on Site

Anytime aspirations or IVF transfers are being performed and anesthesia drugs are present a licensed veterinarian from that state must be present. B & D Genetics provides on staff veterinarians at our home base facility and Texas locations. B & D Genetics abides by all state and federal laws according to this procedure. B & D Genetics does work with several veterinarians in several states and it is possible for us to provide you one the day of the surgery at B & D Genetics cost. However, if you choose to provide your own veterinarian, you are responsible for payment for his or her services that day. If you have other clients attending your embryo collection and transfer that day it is your responsibility to communicate this and coordinate payment to the veterinarian.

7. Donor and Recipient Preparation and Nutrition

Adequate nutrition is imperative to a good embryo transfer program. The term flushing refers a rising gain in nutrition or energy level more specifically over a period of time. If your donor and recipient animals are on a maintenance diet; 60 days prior to programming a rise in feed up to 2 or 2.5 pounds per head per day would be adequate (depending on quality of feed/hay). Once the IVF program is completed donors can be placed on the selected diet of owner's choice. It is our recommendation that recipients are maintained on the diet until pregnancy detection.

Donors in "show shape" or in a body condition score (BCS) of 4 or 5 (BCS range is 1-5) are overweight. This is an issue when placing them into an IVF program. It is recommended that these donors gradually lose weight by decreasing their ration over a period of 60-90 days prior to flush date and be in a BCS of 3 at time of synchronization.

Justification: This rising plane of nutrition can help stimulate a population of follicles on the ovaries of the donor to be more responsive to FSH stimulation. For recipient females this can result in a higher quality corpus lutuem at transfer, thus resulting in higher pregnancy rates.

Obese animals typically do not respond to stimulation as well, have shorter estrus receptivity periods, and have longer recoveries, and higher chance of complications from the aspiration procedure. Therefore, bringing obese donors down to pasture shape or "working clothes" or BCS 3-3.5 is recommended.

All IVF embryo's produced by B & D Genetics and its affiliate laboratory will only be allowed to be maintained for storage at B & D Genetics LLC. Frozen and/or fresh IVF embryos produced by B & D Genetics and its affiliate laboratory will only be allowed to be transferred by B & D Genetics LLC.