White Oak Veterinary Clinic

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7631 Glades Pike
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IVF frequently asked questions

What is In Vitro Fertilization embryo transfer?

In vitro fertilization for embryo transfer is a technology that has been around for some time, but has only recently become used routinely by cattle breeders. It differs from conventional flushing in that the oocytes (eggs) from the donor female are removed prior to fertilization. The collected oocytes are then fertilized in a lab. There, the embryos are allowed to develop for a week. The embryos that develop are then transferred into recipient animals or frozen for transfer later.

How are the oocytes collected?

Oocytes are collected by a process known as trans-vaginal follicular aspiration, also called oocyte pick-up (OPU). By using ultrasound guidance, a needle is inserted directly into the ovary from inside the vaginal canal. A vacuum pump is then used to aspirate the fluid in the follicle, bringing the oocyte with it. The collected fluid is then filtered and the oocytes are removed under a microscope.

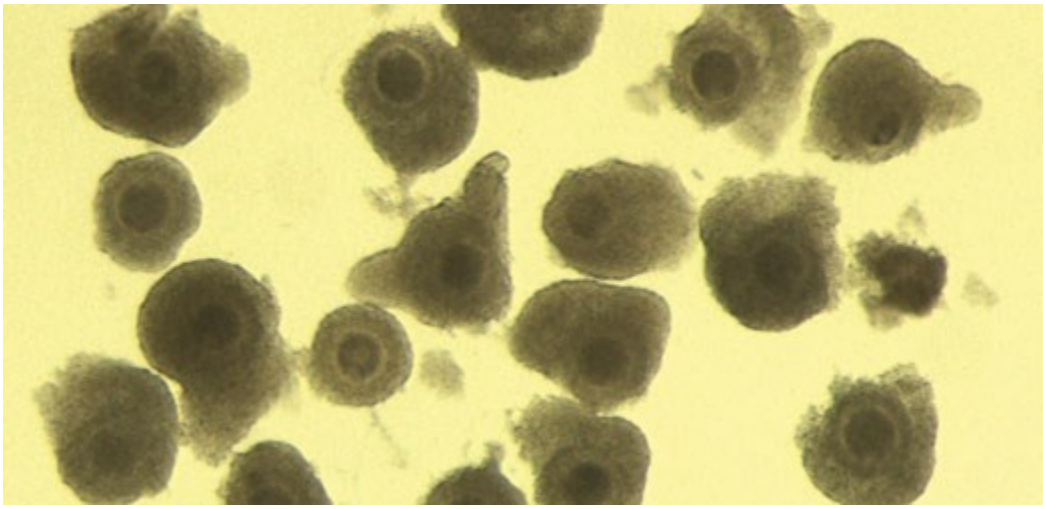

Figure 1. Oocytes after aspiration

Is there a risk to the donor animal?

There is very little risk to donor animal from this procedure. Theoretical risks include bleeding, scarring and infection, but these are not usually seen, even in donors that are collected regularly.

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What does it cost?

Please see the attached fee schedule for examples.

Where does the fertilization take place?

We have been shipping the oocytes in an incubator to an outside laboratory by overnight express. The resulting embryos are returned to us a week later in the same incubator by overnight express.

Figure 2. Incubator

Can you freeze IVF embryos?

Only the best quality embryos should be frozen. Labs are now freezing embryos in direct transfer medium (quick thaw) with little to no compromise in fertility.

Can gender sorted semen be used?

Commercially available sorted semen can be used with good success. Most sorted semen should be tested prior to collection of the donor.

Which cattle should be used as donors?

Just like conventional embryo transfer programs, superior females are the best candidates.

Can I collect pregnant cows?

Pregnant cows can be used as donor animals without increased risk of pregnancy loss up to about 100 days of gestation. After that time, the ovary becomes physically out of reach preventing collection of oocytes.

What type of facilities do I need?

The donor has to be adequately restrained during the procedure. A fitting chute is adequate for a dairy cow, however, a beef cow should be restrained with a squeeze chute. Movement of the donor during aspiration will dramatically reduce embryo yield.

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Do I need a Laboratory to process the oocytes?

We have a portable laboratory that is climate controlled and dust free that we use to process the oocytes once they are aspirated. We use the same lab to process the resulting embryos for transfer.

Figure 3. Mobile laboratory

Do donors have to be stimulated?

Yes. Stimulation with a follicle stimulating hormone (FSH) is critical to the success of an IVF program. Donors are given 6 to 7 shots 12 hours apart with the last dose given 1 to 2 days prior to collection.

Can I collect virgin heifers?

Virgin heifers, as long as they have reached puberty, can be collected**.**

How often can a donor be collected?

As frequently as every 2 weeks. A regular collection of every 2 weeks will actually increase embryo yield per OPU session compared to a single OPU.

What is the average yield of embryos?

Average yield of embryos has been about 5 to 6 per collection, however we expect that number to rise over time as the technology advances. Like all averages, some animals are very prolific and some are not.

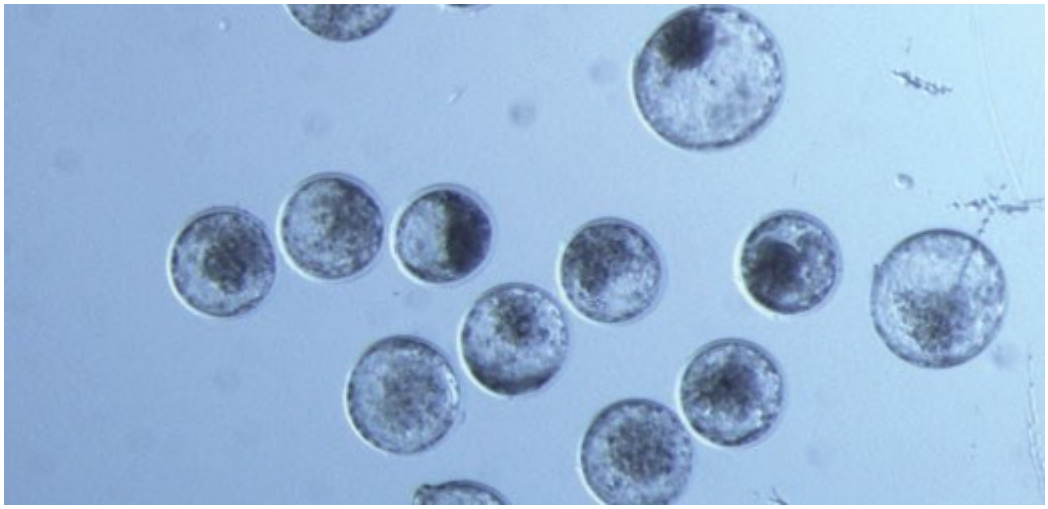

Figure 4. Resulting embryos ready for transfer

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What is the conception rate?

Pregnancy rate in fresh IVF derived embryos is around 50%, depending on the quality of the embryo. Results will vary from farm to farm.

What advantage does it have over conventional ET?

1. Pregnant cows can be still be collected.
2. Donors can be collected every 2 weeks.
3. Sexed semen can be used to fertilize the oocytes with much greater reliability than conventional flushing.
4. Many cows that do not respond to conventional flushing will respond to an IVF program.
5. Since sexed semen can be successfully used, recipient utilization can be optimized to produce 90% heifer calves.
6. Increased embryo yield per donor compared to conventional flushing.

What are the disadvantages of IVF embryo transfer?

1. Need adequate facilities for OPU to control temperature and movement of donor.
2. In order to be cost effective, we need a minimum of 5 donors per session. Not all of the donors have to be from the same farm, but they should all be at the same facility for OPU. More donors will reduce the cost per donor since shipping costs will be distributed among more donors.

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