

THE THREE PILLARS OF IVF SUCCESS: DONOR MANAGEMENT, VYTELLE'S IVF PROCESS AND RECIPIENT MANAGEMENT

PILLAR TWO: VYTELLE'S IVF PROCESS

Vytelle makes the *in vitro* fertilization (IVF) process easy on animals and simple for you. Vytelle utilizes the most modern, all-natural IVF technique which helps move your cattle herd forward quickly by multiplying offspring from your elite performing animals, shortening generation intervals and improving reproductive efficiency. Preparing donor and recipient cows to perform successfully in IVF requires proper management prior to ovum pick-up (OPU) and embryo transfer. From oocyte (egg) collection at the farm to top quality embryos out of the lab, Vytelle helps guide producers to reproductive success throughout our revolutionary IVF process. Vytelle's IVF process includes three steps:

3 PILLARS OF SUCCESS

1

Donor
Management

2

IVF Process

3

Recipient
Management

OVUM PICK-UP

Before the IVF process starts in the lab, the oocytes need to be collected from your donor cows. To do this, trained Vytelle technicians use a small intra-vaginal ultrasound probe and aspiration needle assembly to aspirate follicles off the ovaries of donor cows. (Follicles are fluid filled pockets on the ovary, containing oocytes.) An ultrasound screen is used to visualize the ovary and follicles of each donor. The goal is to remove all follicles from each ovary to maximize oocytes going to the lab. OPU takes 15 minutes per donor on average and can be done on open or pregnant heifers and cows, and up to 100 days in gestation. Aspiration is extremely safe with minimal damage to the reproductive tract and is low risk for pregnant donors. Ovarian tissue heals quickly and follicular growth resumes immediately after collection. Thus, oocytes from the same donor can be collected as frequently as every seven days, with best results seen when OPU is done every two weeks.

VYTELLE'S HORMONE FREE IVF PROCESS

Vytelle's skilled technicians perform oocyte (egg) collection on your donors, without the use of follicle stimulating hormone (FSH), a hormone that is naturally released by females to stimulate new follicles to grow every 7 to 10 days. Injecting FSH into donors is a common process in other IVF systems, as FSH changes the size of follicles, making them more visible on the ovary during OPU. However, using our proprietary process and naturally derived media formulations, our technicians collect oocytes without the use of FSH. Vytelle's process achieves oocyte collection rates similar to other IVF processes that require several injections of FSH. Utilizing a hormone-free process has several benefits for the animal, the product and your business. Vytelle's all-natural IVF process is easier on animals, allows for weekly collection, and is more cost effective.

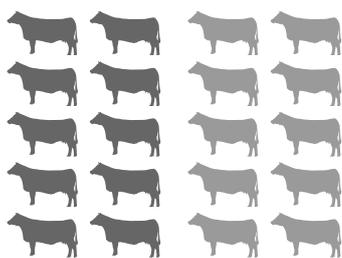
EMBRYO PRODUCTION

Embryo production takes eight days and involves the following steps:

1. *In vitro* Maturation (IVM)
2. *In vitro* Fertilization (IVF)
3. *In vitro* Culture (IVC)

CONVENTIONAL SEMEN

1 straw for 10 to 20 donors



SEXED SEMEN

1 straw for 5 donors



After oocytes are collected, they are delivered to the laboratory technician to be assessed for quality. Atretic (degenerated prior to maturing) or irregular oocytes are discarded from the lot. Remaining oocytes are placed in maturation media and prepared for fertilization 24 to 26 hours post OPU (Figure 1; day 0 fertilization). Oocytes can be fertilized with any sire of choice using either conventional, presorted (male or female) or reverse sort (male or female) semen. One dose of semen can be used across multiple donors to maximize semen utilization and produce several embryos. If enough oocytes are collected, multiple sires can be mated to a single donor from one OPU. Semen is added to the fertilization plate and encompasses the eggs to start fertilization. After 24 hours of fertilization, the zygotes (fertilized ovum) are removed from the fertilization dish and placed in culture for 7 days. Embryos are monitored in temperature regulated incubators for development and cleavage (natural cell division from a fertilized ovum) on day four after IVF. Embryo evaluations for quality and quantity are done on day six to predict which embryos will qualify for fresh transfer or freezing on days seven and eight.

With Vytelle you pay only for the embryos produced, with no additional or hidden fees. While other IVF providers charge set fees for stages of the process, regardless of the number of embryos produced, Vytelle does not charge for conducting OPUs, freezing embryos, or any other part of the embryo production process.

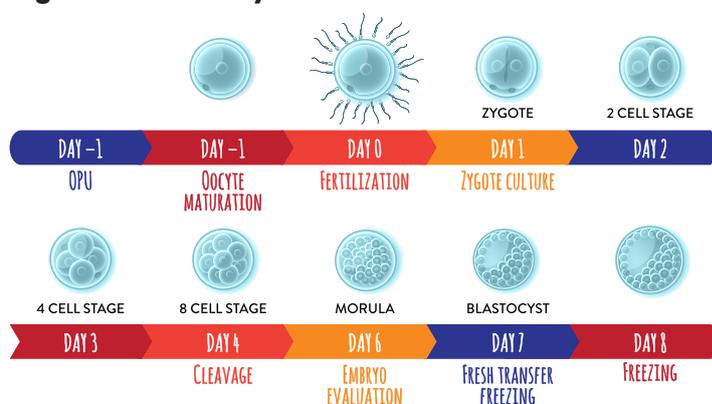
EMBRYO IMPLANTATION

Embryos are cultured and ready for fresh transfer or freezing 8 days after OPU. If you require fresh embryos, the embryo is transferred to qualified recipients on implantation day. For best results, IVF embryos should be transferred into recipients that are on day 7 or 8 of their estrous cycles. Recipient cows can be synchronized to prepare several cows for embryo transfer at one time. Cows that come in heat naturally within 24 hours post OPU are excellent recipient candidates for fresh embryo transfer as well. An experienced embryo transfer technician should be consulted to complete embryo transfer on qualified recipients. Vytelle's embryo thawing protocol, available on the freeze certificates, should be followed for best results when using frozen embryos.

SUMMARY

Vytelle's IVF process makes genetic goals a reality for beef and dairy producers worldwide. Vytelle's modern, all-natural technique is easy on animals, simple for you, and cost effective. Identify your elite donors and contact Vytelle to start accelerating your herd's genetic progress today.

Figure 1. IVF Embryo Production



¹ Farney, J. et al. (2016), Guide to Body Condition Scoring Beef Cows and Bulls, Kansas State University.