YOUTH USES CLONING TECHNOLOGY TO EXTEND THE INFLUENCE OF A GREAT COW

If you look carefully at the right hip of one of the two Black and White Holstein clone heifers of Connor Erbsen, you will see a spot in the shape of a heart. It is even more appropriate, when you ask Connor the name of his heifer…Love of Peace. The other clone heifer in the family farm's immaculately groomed stall at the World Dairy Expo is named Hope of Peace. When we caught up with Connor Erbsen and his father, John Erbsen on October 7, 2011, Hope of Peace had been named the Winter Calf Winner in the Black and White Holstein Junior Show at the World Dairy Expo in Madison, Wisconsin earlier in the week. Both heifers are genetic twins or clones to Erbacres Goldwyn Peace, a Goldwyn daughter that was an elite cow owned by Connor's father, John Erbsen of Lanark, Illinois. Peace was an All American nominee as a heifer and classified VG-88 as a 2 year old. She descends from the world-renowned Dellia family at Regancrest Holsteins in Iowa.

Photo by John Erbsen

To add to this remarkable story, we asked Connor's dad how he came to clone this particular cow. Mr. Erbsen had been instrumental in producing the well-known clone heifers out of KHW Regiment Apple-Red-ET along with partner Mike Deaver from Edgerton, Wisconsin and later the Apple Partner Syndicate. He was familiar with the power of the technology and understood the value creation that it brought to the partner's programs. So when Peace died unexpectedly, he acted quickly and took a deceased animal sample on her and produced a cell line through Bovance. Bovance is able to grow living cell lines on deceased animals several days after the death event, provided the tissue is kept in cool, but not frozen condition and sent to our lab immediately. Later, he made the decision to provide Connor with an opportunity to work with this exceptional genotype and decided to clone Peace. The two heifers, Hope and Love, were the result of that decision.

To add to an excellent week for the Erbsens, the genetic donor KHW Regiment Apple-Red-ET, owned by the Apple Partners, was named as the Grand Champion Female of the International Red and White Holstein Show at the World Dairy Expo, pairing with her clone to win Produce of Dam Champion. She came back on Saturday night with showman Mike Deaver to exhibit in the Supreme Championship line up. In addition, a genetic twin or clone to Apple, Apple 3, was named Intermediate Champion in the same show and a spring clone heifer, Apple A2, was second in her class. Congratulations to the Erbsen family, and the Apple Partners, on their decision to use the technology of cloning to extend the influence of great genotypes like Peace and Apple.

TRANS OVA genetics

Celebrating 30 Years

Client Newsletter • Winter 2011

IN THIS ISSUE:

Trans Ova Genetics is dedicated to meeting the requirements of our customers and to continual quality improvement.

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800.999.3586

www.transova.com

WELCOME - DR. MARK ALLAN

Trans Ova Genetics has announced that Dr. Mark Allan has joined the Trans Ova Genetics team as the Director of Marketing and Genomics, based out of the company's headquarters in Sioux Center, Iowa.

In this position Allan will continue to develop the sales, marketing, and client service aspects of Trans Ova Genetics. Dr. Allan will work to maintain leadership and growth for Trans Ova Genetics in the areas of embryo transfer, in vitro fertilization, sexed semen, and other advanced reproductive technologies in the beef, dairy and rodeo stock industries. He will also help industry stakeholders gain understanding of the potential genetic gain utilizing Trans Ova Genetics assisted reproduction tools coupled with the power of genomic information.

"Mark Allan brings tremendous industry knowledge in both beef and dairy, and in seedstock and commercial applications," says Dr. Dave Faber, president of Trans Ova Genetics. "His industry understanding, coupled with his knowledge of genomics and its application towards genetic gain, will be a great asset to the company."

Before joining Trans Ova Genetics, Allan was the Associate Director of Global Technical Services for Pfizer Animal-Health Genetics where he provided technical support to the Pfizer Animal Health field force and their customers as well as key industry constituents. He was instrumental in the development and launch of Pfizer's Angus HD 50K, a high density DNA tool enabling enhanced genetic improvement in Angus cattle.

Dr. Allan earned his undergraduate animal science degree from the University of Nebraska. Upon graduation and for the next seven years, he established a career in the beef industry, working directly with purebred cow/calf production, first as the herdsman for Adams Brothers and Co., Kilgore, NE, and later as the manager of Sullivan Limousin, Dunlap, IA.

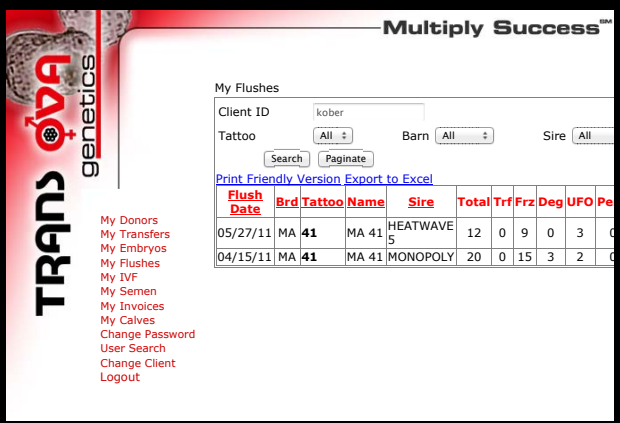
Dr. Allan returned to graduate school at the University of Nebraska, and upon earning his Ph.D. from the University of Nebraska, he served as a Research Geneticist for the United States Department of Agriculture's Agricultural Research Service at the U.S. Meat Animal Research Center (2003-2008) in Clay Center, NE. In that position, he provided leadership in DNA mapping of production traits in beef cattle, with a large portion of his work focused on feed efficiency and reproductive performance.

Mark and his wife Alise are the proud parents of Kiley and Brady.

"Mark's industry understanding, coupled with his knowledge of genomics and its application towards genetic gain, will be a great asset to the company."
- Dr. David Faber, President, Trans Ova Genetics

MY TRANS OVA.COM - YOUR TOOL FOR SUCCESS

How many of you have experienced one or more of the following situations?



It's 9:00 at night and you just remembered that you were supposed to have called Trans Ova Genetics to give them your breeding choice for a donor, but you can't remember what semen you have in your account?

OR You lost your recent invoice and you know you need to get that check in the mail to get your early pay discount. You call at 4:15 PM and get the automated voice system, then remember that you are in a different time zone.

OR It's time to register calves, and as you sit down one Saturday afternoon to work on this, you realize you do not have the recovery dates.

OR You are at a show for a few days, and while you are at the show, you still wonder how your donors are doing back at Trans Ova Genetics, but you never have any time during the day hours to call?

All of the above situations can be easily remedied if you are using *mytransova.com*. It allows you 24/7 access to your embryo and semen inventories, procedure dates, invoices, implant history including expected calving dates, and live calf information. How much does it cost to gain access to all this information? Nothing. It's a free service offered by Trans Ova Genetics. One call to your Trans Ova Genetics client service representative is all it takes to get signed up. Choose a user name, and have a valid e-mail address to complete the process. The site is secure, as you will be the one selecting your personalized password.

By now you are maybe wondering if the *mytransova.com* site is going to replace the customer service representatives? Absolutely not! This service is not intended to take away from having someone to personally talk to and answer your questions, but it is intended to be an enhancement to our personal service for the times when we just can't be there. Please call us to today to get signed up.

Dorene Vander Zwaag, Client Service Representative, Iowa

NEW IVF SATELLITE CENTER OPENS IN LOUISIANA

Trans Ova Genetics announces a new satellite center, in partnership with JC Bar Genetic Center, located in Livonia, LA.

JC Bar Genetic Center, a locally owned and operated donor and recipient housing facility located 45 miles southeast of Baton Rouge, known for their excellent donor care, will host the new Trans Ova Genetics satellite center.

The new location offers breeders IVF facilities that are closer to their breeding operation and well-equipped to both house and synchronize donors.

For additional information or to schedule procedures, please contact Trans Ova Genetics at 866-924-4586.

THINKING AHEAD TO SPRING SCHEDULING

Fall is quickly turning to winter for many of our clients, and we at Trans Ova Genetics hope that you had a safe and profitable fall. Before we know it, the holiday season will be upon us, and for many, calving will follow shortly thereafter.

Although it may seem early, it is actually a great time to begin planning your reproductive work for spring of 2012. Some of the things you may want to be thinking about at this time include:

Identifying potential donors – There is no better time to decide which donors will enter your ET program than when this year's calf crop is fresh in your mind. Make sure that all management practices are reviewed so that your donors transition through calving smoothly and have the best opportunity to have optimal results from a reproductive standpoint afterwards.

Building a bank of frozen embryos – If you have donors that are being held open over the winter, this will be a great time to produce embryos and freeze them to be thawed and implanted in the spring.

Estimating recipient needs – Trans Ova Genetics has a large demand for recipients from our clients each spring, and given the tight supplies of cows in the country this year, we are already making purchasing decisions to accommodate this. Any information you can provide us in regards to your intentions for utilizing our recipients will allow us to better plan for ensuring adequate numbers are available.

Semen collection and sorting – Trans Ova Genetics offers custom semen collection and sorting for our clients. However, in the spring we quickly reach our capacity for the number of bulls we can house and the amount of semen we can sort. In order to ensure that we can produce the sorted semen you need in time for spring breeding, make plans to schedule this work well ahead of time.

IVF technology – If you have not utilized IVF previously, now is a great time to visit with a Trans Ova Genetics representative about how this technology can complement and enhance your breeding program as you plan your reproductive work for the coming months.

While this is certainly not an exclusive list of things to be considering this time of year, it may be a good place to start planning for 2012. May you and your family have a happy holiday season!

Scott Metzger, Dairy Sales & Client Service Manager

Season's Greetings

From TRANS OVA genetics

EMBRYO TRANSFER and IN VITRO FERTILIZATION

WHAT'S THE BEST OPTION FOR ME?

Many breeders have elite females from which they can market valuable genetics and offspring. With the use of advanced reproductive technologies, more offspring can be propagated to help multiply the success of breeding and marketing programs. While many breeders are familiar with embryo transfer (ET), an increasing number of breeders are implementing In Vitro Fertilization (IVF) into their reproductive programs.

Embryo Transfer

Conventional (in vivo) ET involves specific hormonal treatment (with follicle stimulating hormone) of donor cows and heifers to cause multiple follicles to ovulate. The donors are bred using artificial insemination (AI) following superovulation after estrus (standing heat). Approximately seven days after insemination, embryos are non-surgically collected or "flushed" from the donor's uterus and transferred fresh into synchronous recipients who will serve as surrogate mothers, or frozen to be implanted at a later date.

Embryo transfer is one option that can increase a cow's reproductive efficiency, allowing her to have numerous calves per year. While the average cow produces six to seven calves in her lifetime, ET can increase her reproductive efficiency to numerous calves per year – allowing breeders to multiply the success of their superior pedigrees.

Embryo transfer is a very accessible technology and produces the option to have embryos transferred fresh into synchronized recipients, or to have the embryos safely frozen to be transferred at a later date.
By creating more offspring that are valuable to a herd, breeders can advance their marketing opportunities, improve the reproductive performance, and enhance the rate of genetic gain.

In Vitro Fertilization

An IVF collection, called an Aspiration or Ovum Pick Up (OPU), is the process of harvesting unfertilized oocytes, (unfertile eggs) directly from the ovaries of a donor cow or heifer. Recovered oocytes are fertilized one day after aspiration, and transferred seven days after fertilization. During this eight-day time period, they are cultured and grown in an incubator with controlled media, temperature and environment to mirror the cow's uterus. They are then transferred into recipient cows seven days after the recipient's standing heat or estrus, which is similar to the transfer process for embryos produced by embryo transfer.
Breeders who choose to use IVF technology have the opportunity to obtain more offspring from valuable females in their herd, similar to the benefit of embryo transfer. Many breeders do not realize however, the additional benefits they can experience when using IVF.

IVF is a technology that allows breeders to collect offspring from open cows, pregnant cows, virgin heifers, as well as problematic females that have had difficulty in conventional breeding attempts. It is also possible to retrieve oocytes (unfertilized eggs) from donors shortly after a death event to produce one final genetic collection.

The applications of this technology allow breeders who would like to get a jump on the next generation to do so without altering other vital aspects of their breeding program. Historically, breeders were forced to decide whether to risk future productivity of young donors by flushing them as virgin heifers or just postponing embryo production until after their first calf. Using IVF technology to create pregnancies from a donor gestating her natural calf allows breeders to generate offspring from elite heifers and keeps them on an annual production cycle to calve on schedule with the rest of the herd.

When compared to embryo transfer, IVF may further maximize the potential of an elite female in a shorter time period, as the interval between IVF aspirations is shorter than the interval between traditional embryo transfer sessions. It is possible to obtain IVF cycles every week or every other week, whereas most embryo transfer programs will collect donors every 60 days.

While conventional embryo transfer generally requires the use of two to three units of semen per donor, IVF can be used to maximize the value of rare, sexed, or expensive semen. One unit of semen can be applied to

oocytes from up to eight different donors, or semen from several different bulls may be used to fertilize a group of oocytes collected from an elite female.

There is a perception in the industry that IVF is a more costly option. However, it actually becomes more cost effective than traditional embryo transfer on donors that produce limited numbers of embryos. This fact – coupled with the opportunity to increase the number of calves, the sex ratio of the calves and the ability to increase the opportunities for collection, makes IVF a leading choice for the progressive producer looking to increase the number of offspring that create the most value in their program.

What's the best option for me?

Embryo transfer is likely the best choice for prolific embryo producing donors that can meet the owner's embryo production needs. In this scenario, embryo cost is economical and in vivo embryos hold a slight pregnancy rate advantage for both fresh and frozen embryos when compared to IVF.

In many instances, IVF provides more value. It is more cost effective to use IVF on low embryo production donors or females you would like to keep in the production cycle. Additionally, IVF can reduce donor boarding costs and semen costs by utilizing a single straw of semen to fertilize multiple embryos, with the opportunity to use more than one sire on a single donor aspiration. IVF is also a more economical choice if offspring of one gender are strongly desired from bulls that do not have frozen sexed semen available. Even if the initial cost of the procedure is higher, the actual cost per embryo will often be lower.

Conclusion

Depending on the specific needs of a breeder's program, various approaches can be taken. It is important for producers to understand how each and every reproductive technology can be used to benefit your operation. While IVF may not be the answer for every donor program, many have realized it is a tool that offers unique opportunities to extend elite genetics provided by both proven donors and rare or expensive sires.

To effectively and economically integrate IVF technology into a breeding program, breeders are encouraged to carefully review their goals, understand the opportunities and limitations of both options, and work with an experienced, professional team to determine the best advanced reproductive technology programs to meet their goals.

	In Vitro Fertilization	Embryo Transer
advantages	• Averages 4 - 5 embryos per collection. • Can be performed on pregnant donors up until day 100 – 120 of pregnancy. • Can be performed on juvenile heifers. • Can be performed every week or every other week. • Can be used on healthy or clinically infertile cows that aren't responding to ET. • Most cost effective on donors that either failed to produce or produce low numbers of embryos per collection in ET. • There is less cost for boarding per procedure for IVF (because of the short interval time period.) • Can fertilize multiple donors with a single straw of semen. • Can use sexed semen from either previously sorted or from unsorted frozen semen. • Almost all bulls can be used to create sexed semen to use in IVF. • Embryos can be shipped fresh directly on farm or transferred into Trans Ova recipients	• Averages 5 - 6 embryos per collection. • Studies show that embryo transfer procedures lead to a slightly higher pregnancy rate – 6 to 7 percent advantage on embryos transferred fresh, and a 10 percent advantage on embryos that are frozen then transferred. • Prolific embryo producing donors have an advantage in cost per pregnancy due to better conception rates. • Embryo Transfer is a technique provided by numerous practitioners across the US. • Countries have current export protocols and are able to accept ET embryos.
disadvantages	• Requires highly skilled professionals to perform aspiration. • Slightly lower pregnancy rates when compared to Embryo Transfer – 6 to 7 percent disadvantage on embryos transferred fresh, and a 10 percent disadvantage on embryos that are frozen then transferred. • Embryos produced via IVF are difficult to freeze without a high degree of variability and they may require a skilled practitioner to thaw (especially if vitrified). • Some countries either do not have protocols or are still developing protocols for IVF embryo export.	• Procedure can only be done every 45-60 days. • Limited number of bulls with sexed semen available. • Requires more straws of semen. • Higher cost in relation to boarding – donor is in clinic for 60 days versus the shorter time required for IVF. • Producers have to choose between flushing virgin heifers or postponing embryo production until after the first calf. • Pregnant cows are not eligible for the embryo transfer procedure.

- Sara Kober, Marketing Specialist

MEET THE DONOR - LCSAF FOREVER LADY S103

LCSAF Forever Lady S103 - owned by Ryan Cattle Company and Megan Haefner, produced 21 heifer pregnancies after she was enrolled in Trans Ova Genetics' IVF program

Can you imagine having 21 heifer calves born out of your top donor in one calving season?

That's exactly what Ryan Cattle Company and partner Megan Haefner will be experiencing and celebrating this holiday season – 21 heifer calves and 2 bull calves out of one of their lead donors LCSAF Forever Lady S103. They were able to reap such great rewards through IVF (In Vitro Fertilization).

Born and bred by the Lemenager family in the state of Illinois, S103's success began with her birth more than 10 years ago. She was a class winner at the Angus Junior Nationals that summer and at the NAILE in Louisville, KY in the fall. She won her division at the Illinois State Fair as well as at the Illinois Beef Expo and was the champion Angus heifer at the University of Illinois Showdown and went on to be the third overall heifer for the entire show.

The desire to multiply this heifer's success was significant; however, she did not excel in conventional embryo transfer. So, after years of attempting to reproduce this exceptional female, her owners enrolled her in the IVF program at Trans Ova Genetics, utilizing the satellite location in Chillicothe, Missouri. And this is where her reproductive success really begins.

Forever Lady S103 was aspirated three consecutive times in a short 30-day time span. Her resulting oocytes were fertilized with sexed-female Lookout semen, sexed-female Burning Up semen and one aspiration was even split down the middle and reverse sorted for females with both Bismarck and Navigator semen. The results were excellent. Every last one of S103's resulting embryos were transferred fresh into Trans Ova Genetics health-certified recipients and resulted in 21 heifer pregnancies and 2 bull pregnancies which consequently tallies out to a 70 percent pregnancy rate.

Thank you Shane Ryan and Megan Haefner for believing in 1) S103, 2) IVF and 3) Trans Ova Genetics!

- Stanton Warren,
Client Service Representative, Missouri

Multiply the success of your herd at any of Trans Ova Genetics' regional and satellite centers

Trans Ova Genetics has local stations to provide advanced reproductive services to cattle breeders across the United States. The corporate headquarters is located in Sioux Center, Iowa, and regional centers are located in Missouri, Maryland and Texas.

Additional satellite centers offer embryo transfer (ET) and/or In Vitro Fertilization (IVF), and are found in Arkansas, Eastern Iowa, Ohio, Oklahoma, South Dakota, and Wisconsin.

Each location is managed by a Trans Ova Genetics team of dedicated experts, who provide special care for each animal and work closely with breeders to help multiply the success of their elite cattle.

For more information on services offered at each of the Trans Ova Genetics facilities, please refer to the map and the pin markers to obtain location and contact information.

Corporate Headquarters

2938 380th Street
Sioux Center, IA 51250
800-999-3586
ET, IVF, Custom Collect Sexed-Semen, Live Calf Program, Recipient Options, Bovance Cloning Services.

Regional Centers

1. 12425 LIV 224
Chillicothe, MO 64601
800-372-3586
IVF, ET, Recipient Options

2. 1233 State Hwy 7
Centerville, TX 75833
866-924-4586
ET, IVF, Horned/Aggressive Stock, Recipient Options, Sexed-Semen

3. 7441 Sharpsburg Pike
Boonsboro, MD 21713
866-774-3162
IVF, ET, Recipient Options, Sexed-Semen

Satellite Centers

4. White/Roos Cattle Co.
9368 NE 225th St.
Fletcher, OK 73541
580-678-7838

5. Olympic Genetics Center
2163 Hwy T-38 South
Grinnell, IA 50112
641-594-4125

6. Butlerview Farm
1710 BE 7750 S Rd
Chebanse, IL 60922
(800) 999-3586

7. Boysel Cattle Company
8348 County Rd 144
East Liberty, OH 43319
937-666-4981

8. Yackley Ranches
18430 308th Ave
Onida, SD 57564
605-295-1220

9. O'Neal Angus
3614 O'Neal Road
Branch, AR 72928
479-847-5731

10. E. New York/Liddle holme farm
58 Tripp Rd
Argyle, NY 12809
866-774-3162

11. Postville Vet Clinic
110 Hyman Drive
Postville, IA 52162
563-380-0912

12. Genetic Futures/Duckett Holsteins
4358 Ed's Lane
Junction City, WI 54443
715-459-6480

13. Siemer's Holstein Farm
16125 Mineral Springs Rd
Cleveland, WI 53015
920-693-3600

14. Oakfield Corners Dairy
3962 Batavia Elba Townline Rd
Oakfield, NY 14125
866-774-3162

15. JC Bar Genetic Center
3121 Fordoche Rd
Livonia, LA 70755
866-924-4586

16. Kingsmill Farm
5914 Kemp Road
Durham, NC 27703
866-774-3162

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