

What is a clone?

A clone is a genetic twin of the original animal that provides the tissue sample from which a cell line is made. Clones are not genetically modified. The clone has the exact same chromosomal DNA – genetic material – as the original animal.

Are clones genetically modified animals?

Clones are not genetically modified. They carry an exact copy of DNA as the original animals.

How long has Trans Ova Genetics been cloning dairy and beef cattle?

For over twenty-five years, Trans Ova Genetics has been working closely with cattle breeders on advanced reproductive technologies. Trans Ova Genetics has offered cloning technology for both pharmaceutical and agricultural purposes for the past seven years. Cloning has been a successful tool for those clients who have chosen to create genetic twins of their elite cattle.

How many clones has Trans Ova Genetics made?

Trans Ova Genetics has produced more than 600 cloned calves, the vast majority of them for pharmaceutical research purposes. In 2006, 70 cloned calves were born for dairy and beef breeder clients. Many clients have chosen to use cloning technology to accelerate advancement of their genetic breeding programs.

How many cloning clients does Trans Ova Genetics have?

Trans Ova Genetics works with dairy and beef cattle breeders across the U.S. About 140 clients have created genetic preservations, or cell lines, of one or more of their elite animals. A genetic preservation is the first step in cloning. One to two percent of Trans Ova Genetics' client base have actually taken the next step and created clones from these preserved cell lines, representing the most elite genetics in the cattle industry.

How many genetic preservations have been made by Trans Ova Genetics?

The DNA of an animal, secured through a simple ear punch, is cryogenically preserved and can be permanently stored to provide a genetic blueprint of the animal. Over the past seven years, Trans Ova Genetics has preserved more than 370 DNA samples.

How many cloned calves are currently gestating at Trans Ova Genetics?

At the present time, Trans Ova Genetics is anticipating the birth of more than 250 cloned calves in 2007. Because of the value of these animals, calves are born under the care of Trans Ova Genetics, using health-certified recipients, and are then raised to at least 30 days of age before the owner takes possession of a healthy calf.

Have any cloned calves been produced for the international marketplace?

To date, Trans Ova Genetics has produced cloned calves only for clients located in the United States. With the growing awareness that meat and milk produced from cloned animals and their offspring is safe, Trans Ova Genetics anticipates – in time – that international interest and marketability for cloned animals from superior U.S.-bred cattle will grow as well. Trans Ova Genetics is prepared to work closely with their clients to meet these future marketing opportunities.

How much does it cost for a cattle breeder to clone an animal?

The cost of cloning an animal can range from \$10,000 to \$20,000 depending on the goals of the breeder and the success of propagating a specific cell line. Because the cost of cloning an individual bovine remains high, it further limits the adoption of this technology to the most exclusive, elite breeding stock.

How does Trans Ova Genetics advise clients as to the financial feasibility of cloning an individual animal?

Cloning allows breeders to copy or replace special individuals that may have been lost too early in their breeding careers, or to increase the genetic impact of existing superior individuals. As with the other technologies and services offered, Trans Ova Genetics' team of cattle reproductive consultants will help clients evaluate the potential and value that may be realized through the cloning of an elite animal. Only the most elite animals will be cloned for reproductive purposes, so as to extend their genetics. Cloning may not fit every breeder's goals.

Under what circumstances might cattle breeders want to clone their animals?

Through cloning, producers can duplicate the animals that contribute the most value in their herds and toward their goals to produce better quality food products. The influence of these animals, through breeding, can help create a more consistent supply of tender, flavorful beef, for example. The cost of cloning will continue to limit the application by most breeders. Therefore, cloned animals will be used for intensive breeding and genetic purposes, not specifically for meat or milk production. Another example of cloning application is in the case of an animal lost early in its breeding career, perhaps even before the value of its genetics is fully discovered. Cloning technology can help extend this animal's genetic influence to contribute to the improvement of food animal production.

Is there special care or steps Trans Ova Genetics provides to ensure greater client success with cloning?

As with all advanced reproductive technologies offered to Trans Ova Genetics' clients, cloning is a part of a carefully planned and implemented genetic advancement program, uniquely defined to achieve individual client goals. For clients that have animals at the elite genetic level and marketing caliber for cloning, Trans Ova Genetics dedicates their trained, professional team specialists to ensure the best possible care throughout the entire process - from DNA preservation to the birth of healthy cloned calves.

Does Trans Ova Genetics expect more producers to clone their animals?

With recent FDA assessments confirming the safety of clones and their offspring in the food system, Trans Ova Genetics does expect the interest in and application of cloning to increase. However, even now, cloning will remain a technology suited exclusively for the most elite tier of genetics and cloned individuals will represent only a fraction of a percentage of tomorrow's cattle breeding foundation.

How does cloning affect the genetic diversity of cattle breeding populations?

Cloning and the use of cloned animals in an elite breeding program must be managed just like A.I. in order to ensure lack of genetic diversity doesn't become a limitation. Furthermore, cloning technology can allow for the preservation of all genetics, and in particular those of unique, diverse bloodlines that may otherwise be lost or missed in traditional genetic selection programs. Using cloning technology, outcross genetics can be preserved to help diversify the population. The production of a clone does not offer genetic gain from the previous generation of parents per se, but does greatly increase the opportunities for multiple mating selections that can, in turn, create significantly greater genetic gains.

Are there animal welfare concerns with cloning?

Trans Ova Genetics maintains the highest standards of care and comfort for all animals housed at their facilities. This same care and superior animal husbandry is critical to the success of all reproductive technologies. Dairy and beef cattle breeder clients trust Trans Ova Genetics to give their valuable animals the best care possible, which in turn helps ensure the best results for their breeding program goals.

Does Trans Ova Genetics consider cloning to be "playing God"?

Trans Ova Genetics is committed to being good stewards of technology. Cloning is the latest advancement in a long list of reproductive technologies, including artificial insemination (A.I.), embryo transfer (ET) and in-vitro fertilization (IVF), that contribute positively to the industry and have improved the quality and safety of our food supply.

Will animal cloning lead to human cloning?

Trans Ova Genetics is not involved with any human reproductive or therapeutic applications and does not intend to be, regardless of the risk assessment and final FDA ruling. Developing livestock genetics to help clients produce a better quality, higher-value food product is the specific focus of Trans Ova Genetics.

Should food from cloned animals and their offspring be labeled as such?

Trans Ova Genetics is not an authority in food labeling. However, it is their opinion that because the FDA has indicated that there is no difference in food produced from cloned animals and their offspring, there is no reason to discern which products were from those animals.

Are there abnormalities with cloned calves?

Yes, abnormalities such as larger birth weights, calving difficulties, or calf mortality do occur. None of these are unique to cloning, and have been experienced with natural or other breeding techniques. Trans Ova Genetics is committed to providing recipient cows and newborn calves with top health and management practices to reduce the incidence of any abnormalities, of any calves – cloned or otherwise.