

## Multiply Success.™

### Genetic Preservation of Cell Lines

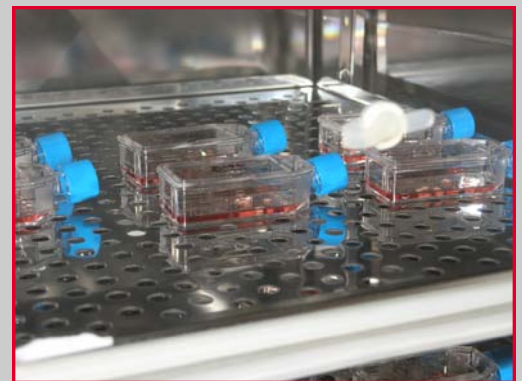
Genetic preservation is the storage of an animal's genetic DNA in liquid nitrogen allowing it to be used anytime in the future for testing or cloning purposes. To begin the genetic preservation process, all that's required is a small biopsy sample to create a cell line. Quite often, the cell line is created from a simple ear punch taken by the animal's owner or veterinarian. In female cattle, even the cumulous cells surrounding their unfertilized eggs (oocytes) can also be used to create a cell line.

Once the tissue sample is received at the Trans Ova Genetics' laboratories, scientists culture the animal's cells. These cells are then grown in incubators for approximately two to three weeks, developing between two to four million cells. Then, the cells are subjected to extremely low temperatures (cryopreservation) to preserve the cells for later use. If the decision is made to clone the animal in the future, the cryopreserved cells are carefully thawed out to restart growth. At this point, only the cells needed are utilized, and the remaining cells can be cryopreserved, leaving a supply of cells to be used at yet another future date.

Only rarely does a biopsy sample fail to yield viable cells. Trans Ova Genetics will contact the owner about four weeks after receiving the biopsy sample to confirm whether or not the cells are viable.

A cell line can serve unique purposes, in addition to being the first step in the cloning process. It allows the owner of elite animals to preserve tissue on any cows, heifers, bulls or steers, well beyond the animal's death. In the past, if an animal died unexpectedly, the owner did not have an opportunity to retrieve or replace those genetics. With a cell line, breeders can do just that – and even preserve genetics on animals that may be dead for several days before a sample is taken. If an animal fails to reproduce because of age, infertility, or disease, the cloned calf can begin the life cycle anew with the fertility of youth. For example, a show winning steer is obviously unable to produce semen, but new cloned calves from his cell line will be bull calves, capable of producing sperm carrying genetics identical to those of the original show winning steer.

Genetic preservation allows breeders to protect their investment, and preserve the option to multiply that investment later through cloning (see "Cloning" section of Trans Ova Genetics website to learn more). If the animal is lost to injury or disease, genetic preservation can be effective insurance.



*Vials containing the cultured animal cells are grown in specially designed incubators. Once the cell line is established, the cells can be effectively cryopreserved to be regrown at a future date.*