



**Welcome
To
Genetic
Preservation
and
Cloning**



Full Flush Clones



Genetic Management Technology



The Biopsy

During the procedure wear latex gloves to avoid contamination of the biopsy

Cleanliness and Sterility are of the up most importance when taking the biopsy

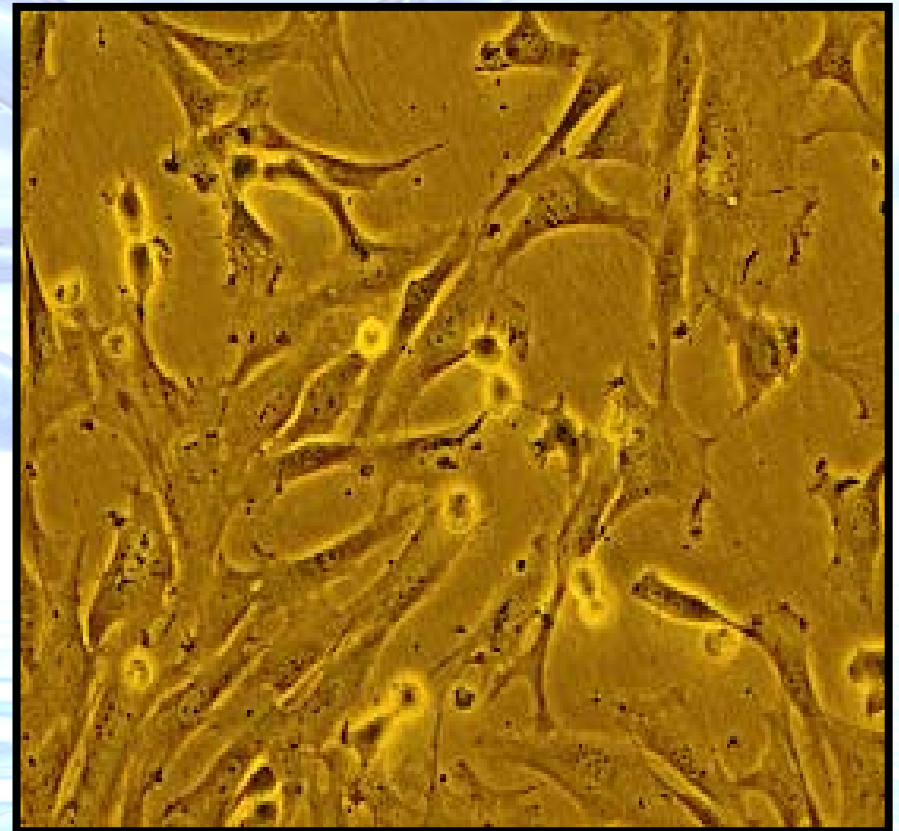


From Biopsy to Ready for Cloning

A Tissue Biopsy



Fibroblast Cell Line



Storage of the Cell Line

Once the cell line is developed it is frozen in liquid nitrogen

The cell lines are then stored in two separate locations



Why Preserve Genetics?

- Keep your cloning options open
- The only insurance policy that can bring back your animal to continue his or her genetic influence
- Ensure genetic diversity for the breed
- Future gene and gene marker testing
- A Gene Bank
- Bio-Security practice
- Future genetic opportunities

Cloning Procedure

Collecting Oocytes

The cloning procedure starts with the collection of oocytes from ovaries



Oocyte Preparation.

Oocytes
(unfertilized embryos)
are incubated with a
DNA specific stain to
identify all DNA
material that needs to
be removed.

The blue areas
indicate genetic
material to be
removed



Enucleation of Oocyte



Host oocyte genetic material being removed



DNA removed leaving just the oocyte cytoplasm

Donor Cell Transfer

The transfer of the founder's fibroblast cell which contains the complete DNA of the Founder

1



2

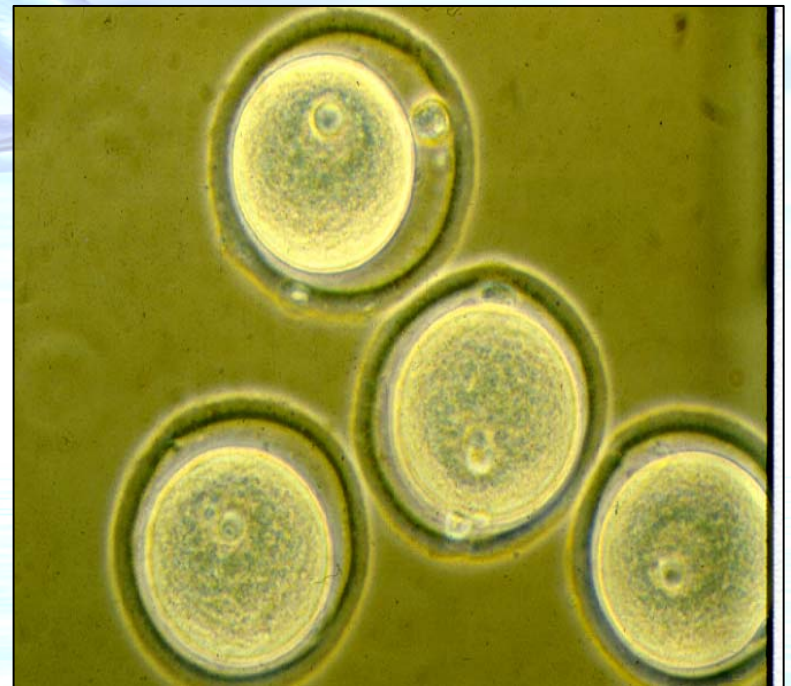
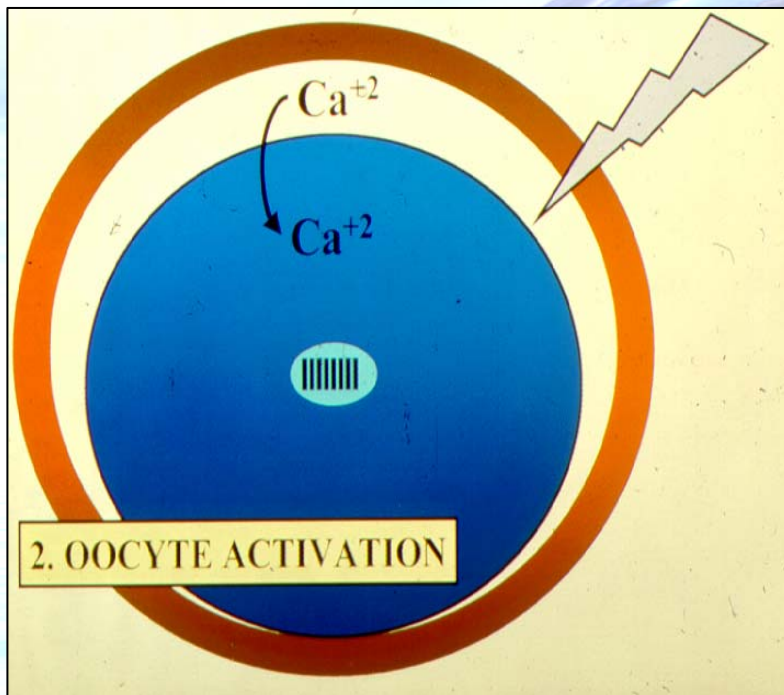


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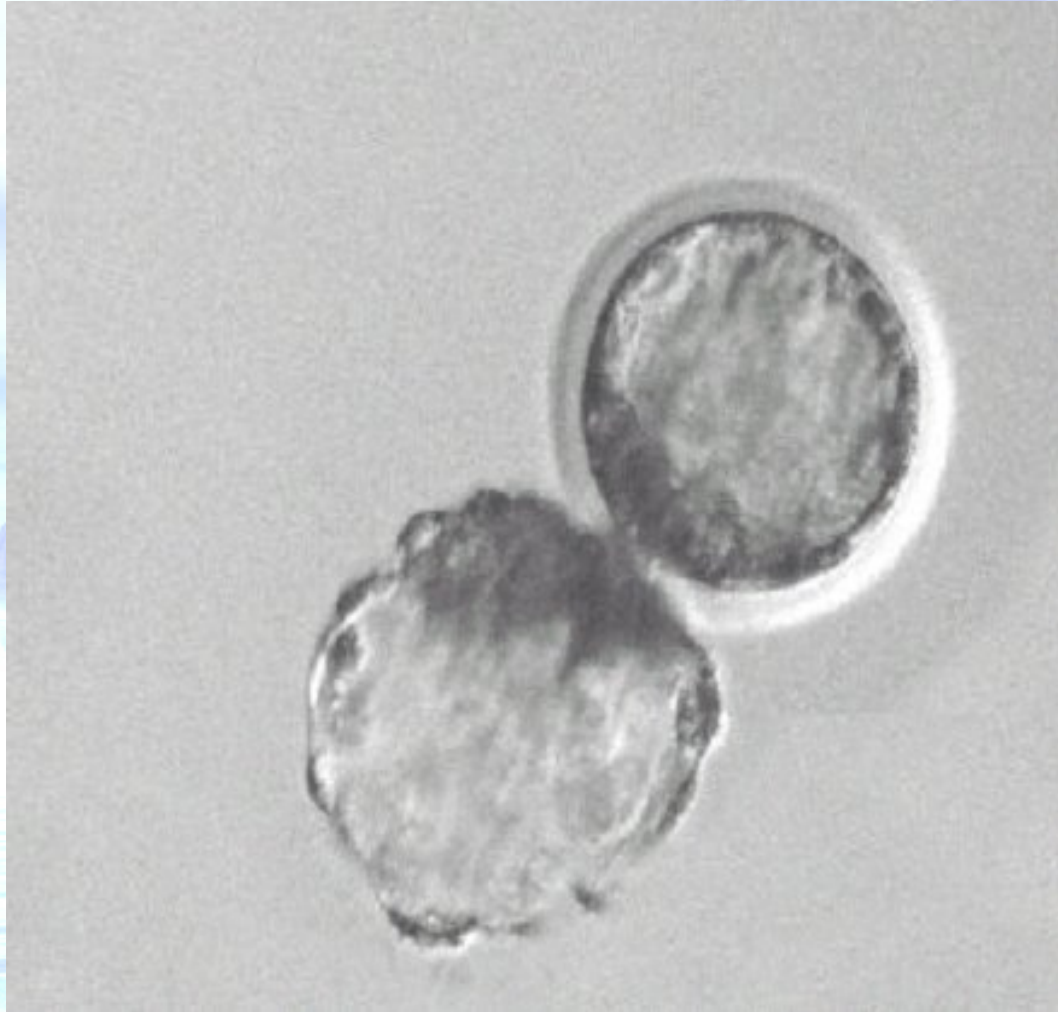


Oocyte Fusion and Activation

This Process Fuses the Fibroblast cell into the Cytoplasm. Cellular development can be seen 4 to 6 hours after Fusion



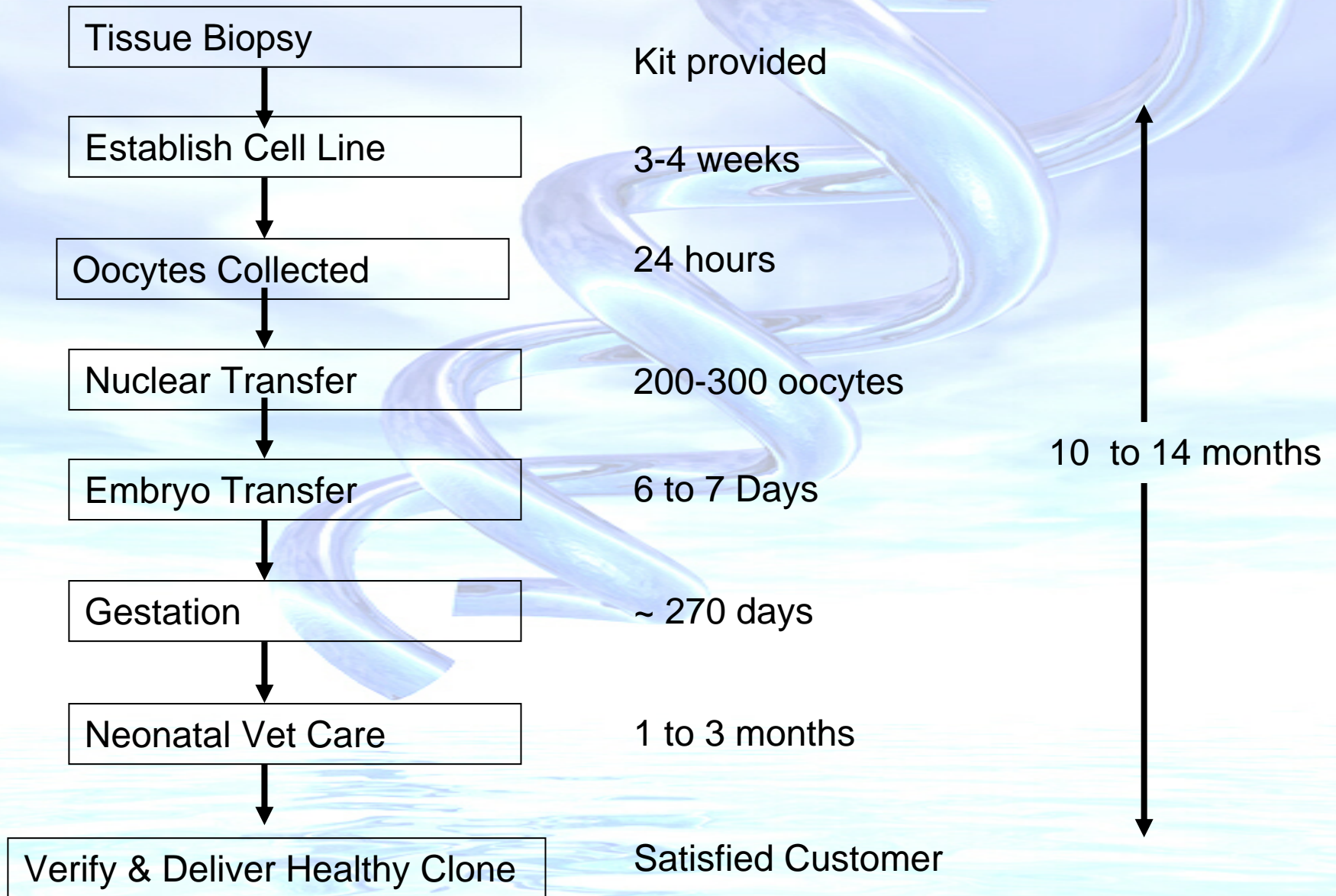
NT Embryo Ready for Transfer



Resulting in a Clone Birth



Cyagra Cattle Cloning Procedure



Why Clone Cattle?

To work with a younger version of a great foundation cow or sire



Castle Hill Evergreen C500

Woodhill Evergreen 120



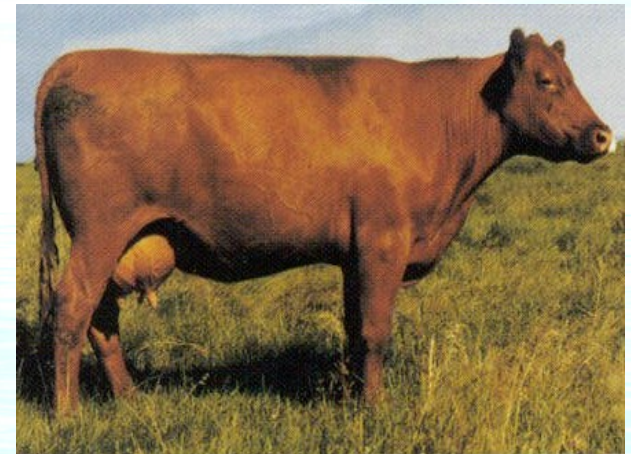
Why Clone Cattle?



First Cloned
Red Angus

Glacier Rebalas

**To continue the genetic
influence of foundation cattle
that are no longer
reproductively sound**



Why Clone Cattle?

Salacoa Pine Lass 23D2

To continue the influence of foundation brood cows for years to come.



First Cloned Brangus



23D2's Clones

Why Clone Cattle?

The First Clone of the Hereford Breed



KSU's Miss Mark K111 and her Clone

Line Breeding Programs can reintroduce Females and Males several generations later to intensify the gene pool

Why Clone Cattle?

Continue with the Genetics of Cattle that die unexpectedly



CYAGRA Unlocks Cloning & Genetic Preservation **Gazette**

Genetic Technology for Today's Breeders

"Ice Pick Returns"

Life After Death...
Ice Pick's clone is born 26 months after his death.

Cyagra ~ helping breeders continue the excitement and profits great cattle create.

CYAGRA Unlocks Cloning & Genetic Preservation
www.cyagra.com

Why Clone Cattle?



To produce multiple copies of an outstanding sire for natural service use

Clones of **Lucero**

Produced at Goyaike
in Argentina



Why Clone Cattle?

To keep up with
offspring and
embryo demand



La Argentina
Clone
and Recipient

Produced by Goyaike
in Argentina



Why Clone Cattle?

To keep up with Semen Demand



Five Full Flush clones

Why Clone Cattle?

HC Power Drive and his Clones



For Semen Sexing

By having multiple clones of the same sire you can make full use of this technology by having many more collections to work with.



Why Clone Cattle?



For Multi-Use Production

To have clones for Genetic Production
and clones for Performance and Showing



Clones of Bandido

Produced at Cyagra Brasil in Brasil



Why Clone Cattle?



GAR EXT 2104 and her clone



Merchandising Opportunities

Cloning allows you to realize the value of your animal, but keep the influence in your herd

Cloning aloud NER Farms to sell the founder Cow for \$70,000 and continue with the genetics with her clone!

Why Clone Cattle?

Turn a STEER
into a BULL

Select a Champion
Steer or a steer with
the high quality
carcass and produce a
clone for semen
production



Why Clone Cattle?

**To Develop a
Foundation
Herd in a Shorter
Time Period**



Feisty Fannie the
World Record Texas
Longhorn Female
holder with a Tip to
Tip Horn
measurement of
82"

Feisty Fannie Clones



Why Clone Cattle?



Cloning allows all partners of a high value animal to have their own clone to work with in their breeding program

**Houdini
and his
clone**

World's First Cloned Rodeo Bull

Why Clone Cattle?



To increase the transfer of genetics between countries

By producing clones in a bio-secure environment or different locations you can open up new or increase the embryo and semen export market

BHR Lady Kyaroo and her clone

Owned by Agro-Zurita in Brazil and house in the U.S.

Cloning

It is important to remember that Cloning is just the production of a genetically identical copy of an animal that already exist.

**The Calf is a Genetic Twin
of the Founder Animal**

Register your Clone with the Breed Association

- All US Cattle Breed Associations accept clones for registry
- NO US Cattle Breed Associations limit the number of copies that can be registered from a particular founder.
- They require the IETS forms A3, A3a, A3b, from the Cloning Company
- They require a DNA Signature from the Founder and Clone and they must match
- They are named with a suffix that varies by breed association like ETN, CL, Clone, CL and a Number etc.
- Some breeds require the Prefix of the Founder remain as the Prefix of the Clone

Genetic Information

US Beef Breed Associations follow basically the same format.

They give the clone the genetic information of its founder until such a time that he or she has their own production data. At that time the clone will have its own individual proof or index.

Or

They pool the genetic information of the founder and his or her clones and then give them all the same genetic information.

SRA Toda la información del sector agropecuario argentino on line, las 24 horas del día, los 365 días del año.

WWW.SRA.ORG.AR

Verification of the clones is done very similar to the process that is in place to in vivo derived embryos.

Once the clones are born, hair samples are sent to the DNA laboratory of the SRA in order to performe the DNA test, this should match a 100% with the DNA or the founder.

I will be happy to
answer questions

For more Information
Contact us in our booth

or



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www.goyaike.com.ar

CYAGRA
Bovine Cloning & Genetic Preservation

Simmental Breeders use Cloning Technology



Lady Kyaroo

Cloning Top Females
allows them to have
the influence that makes
early price real.



Hack's Fraulein

Cloning Older Females
allows them to have
the influence that makes
early price real.



HC Power Drive 88H

Cloning Top Females
allows them to have
the influence that makes
early price real.