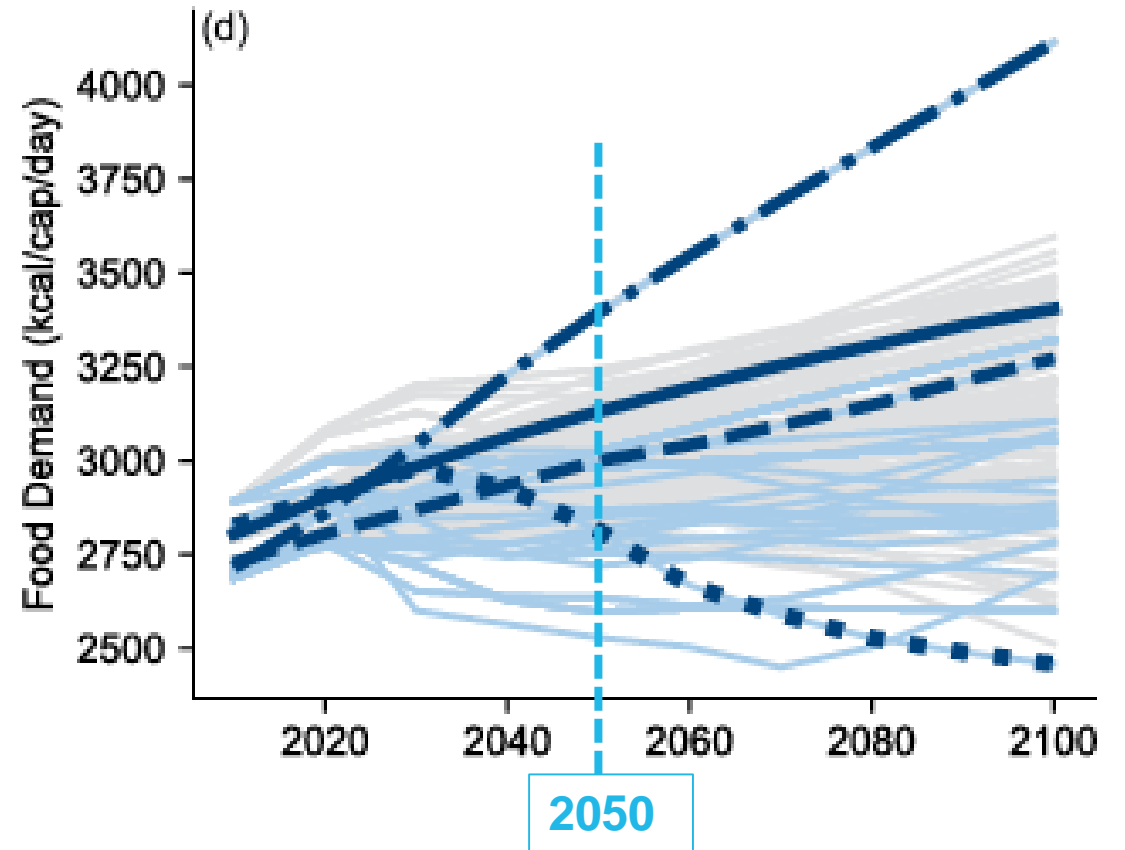
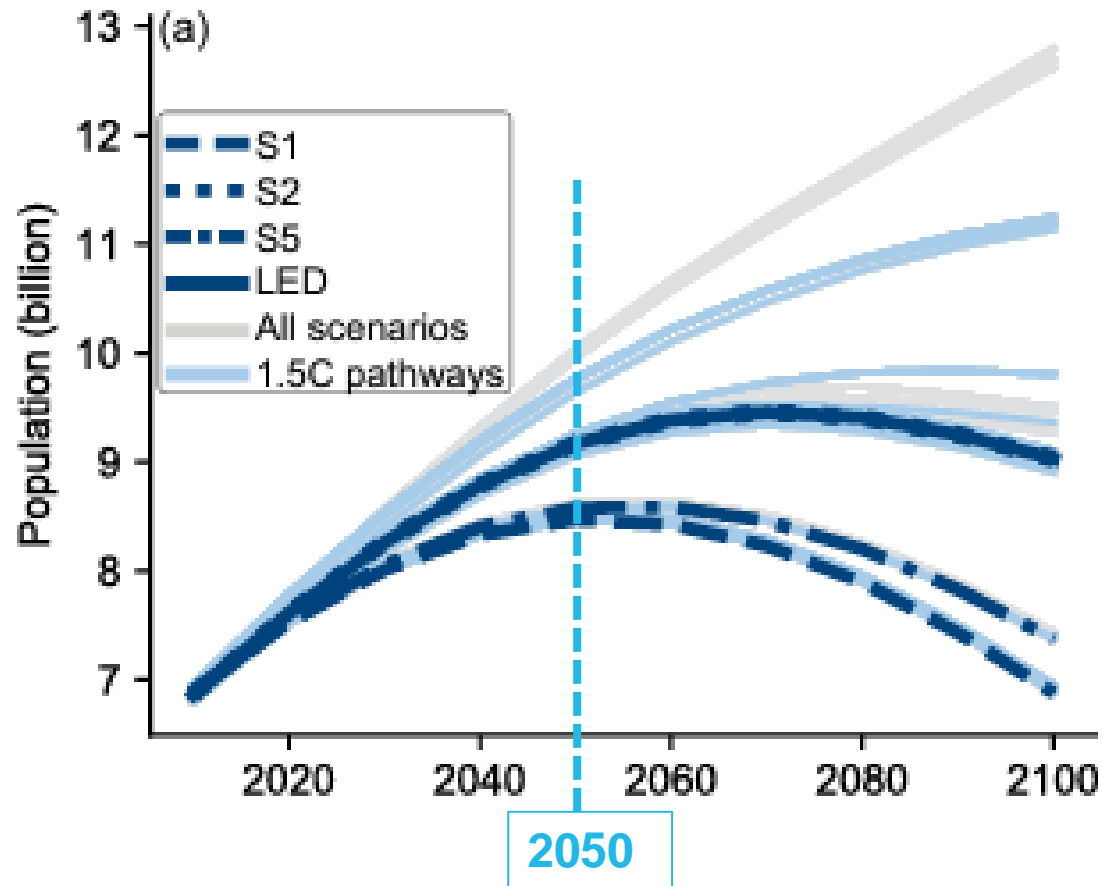




Argentine Milestones in Animal Biotechnology, advantages of a good regulatory approach

MSc. MV. Gabriela Garrappa

Population projections by 2050 vary between 8.5 and 10.0 billion people



Climatic change

Global warming adaptation

↓ Water
↑ Temperatures
Adverse biotic factors

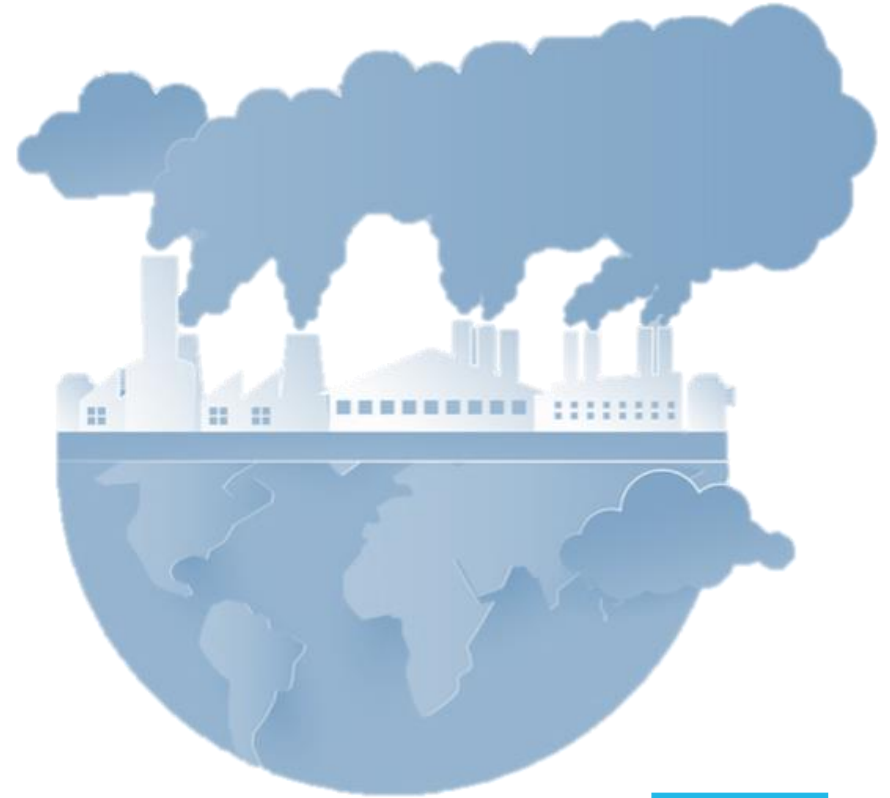
Global warming mitigation



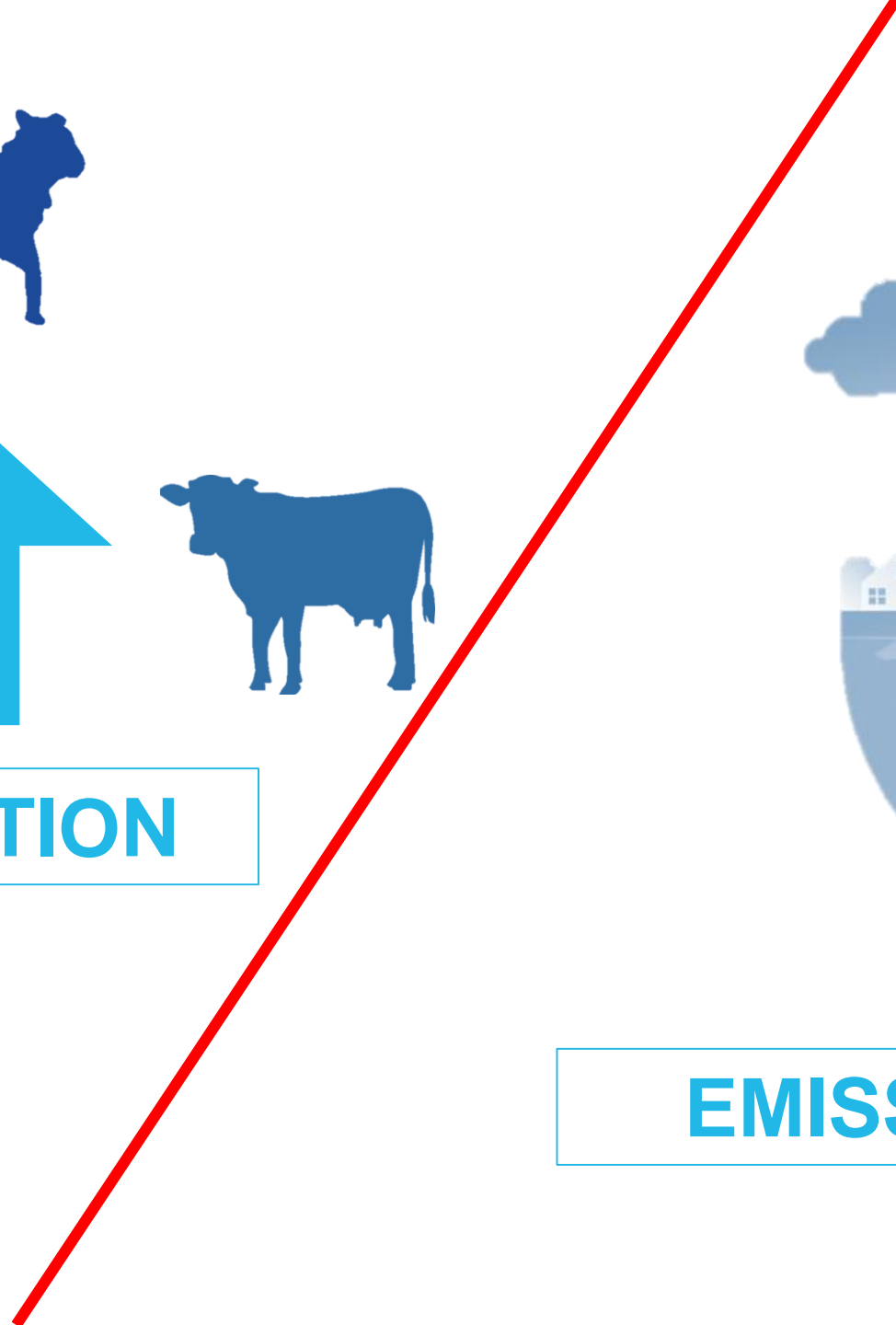
Limiting global warming to 1.5°C would require rapid, far-reaching and unprecedented changes in all aspects of society to reach **net-zero** emissions by 2050.



PRODUCTION



EMISSIONS





BIOTECHNOLOGIES

Sustainability

Resource efficiency
in production





CONICET



August 6th, 2002

Pampa

First cloned animal in Latin America



2002

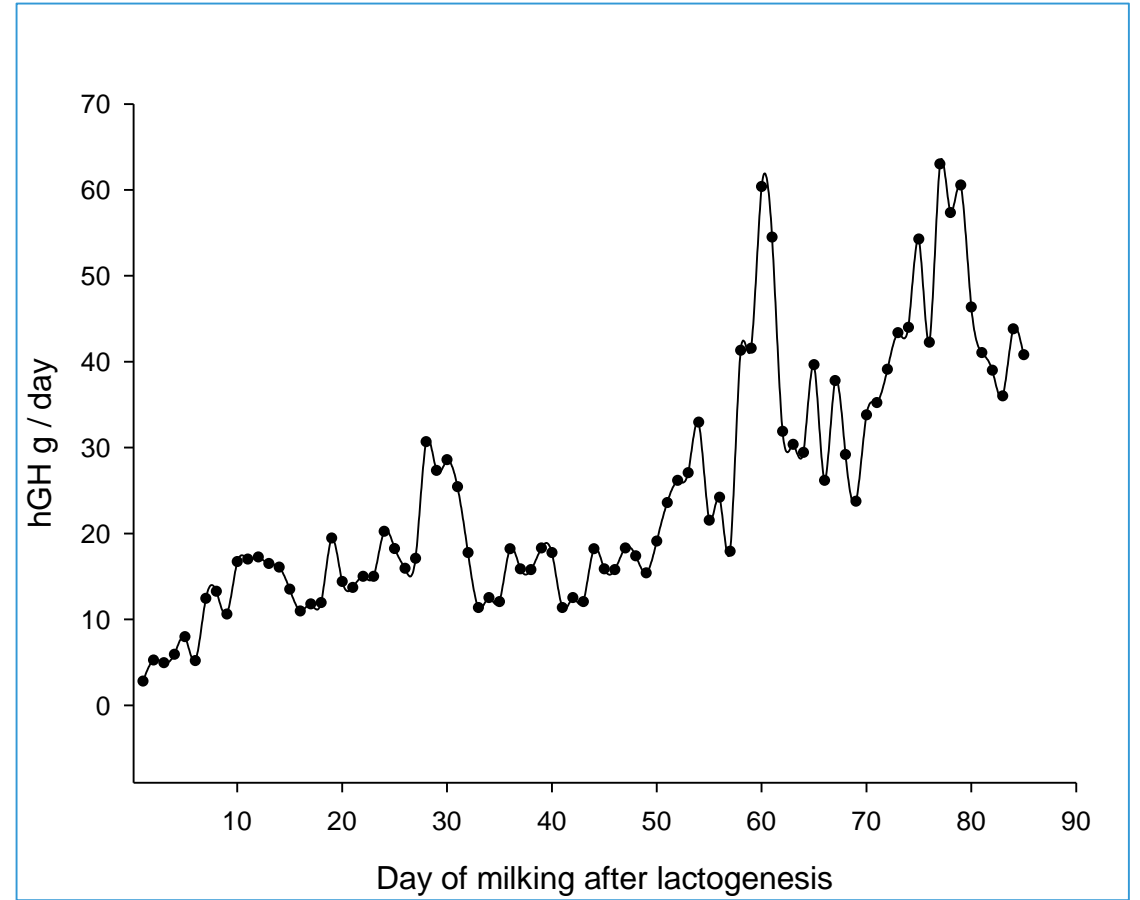
Pampa Mansa

**First transgenic animal in
Latin America**



**Somatotropin
(Human growth hormone)**





15 animals like Pampa Mansa would cover the global demand for Human growth hormone

Pharmaceutical farm



 **BIOSIDUS**
Construyendo un futuro más saludable

CONICET



Salamone et al., J Biotechnology 124:69 2006

December 7th, 2004

Pampero



Cloned bull which carries hGH gene in its germ cells



April 2011

Rosita ISA

**First bitransgenic bovine
in the world**



Rosita ISA

Lactoferrin and lysozyme

“Human-like milk”

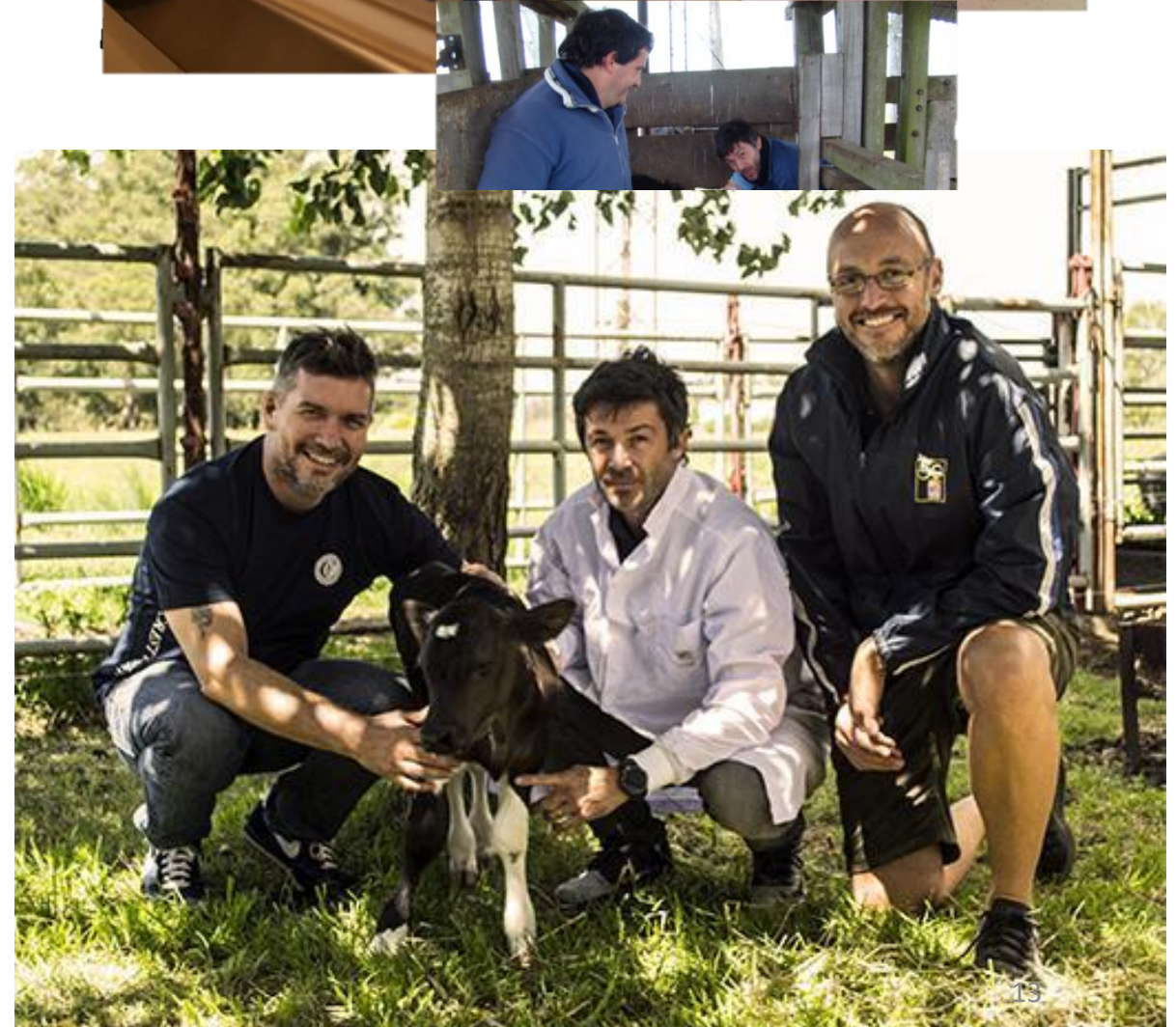
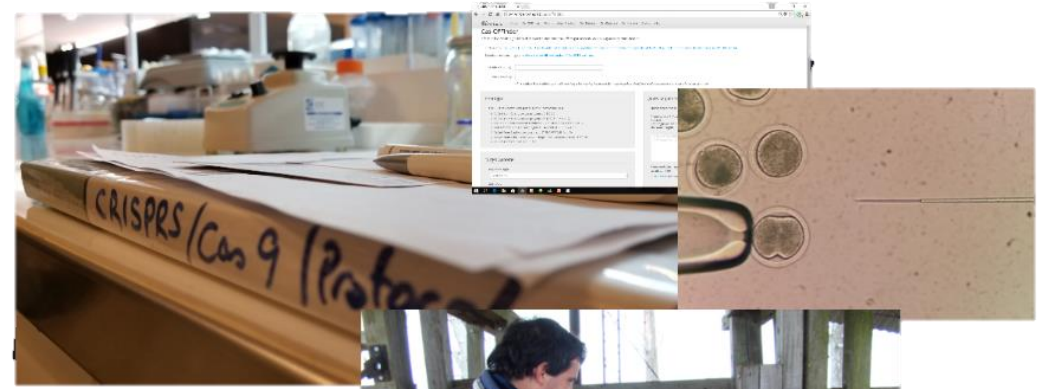


2018

Gene Editing Cow

Know-out
 β -lactoglobulin

Hypoallergenic milk

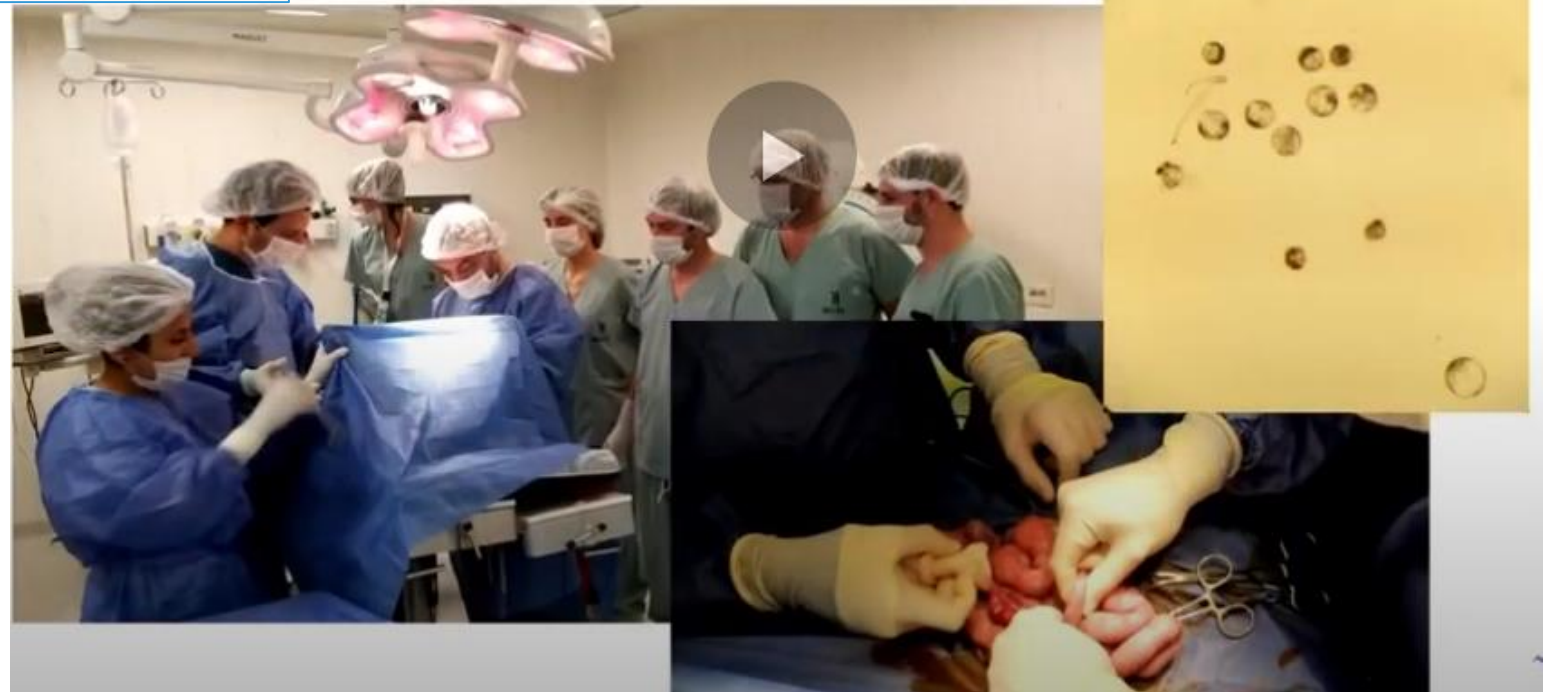


2018-2019

Initial stages

GnEd Pig

Growth regulation genes



2017

Sheep

Cloning – GnEd - GM

umai Universidad Maimónides

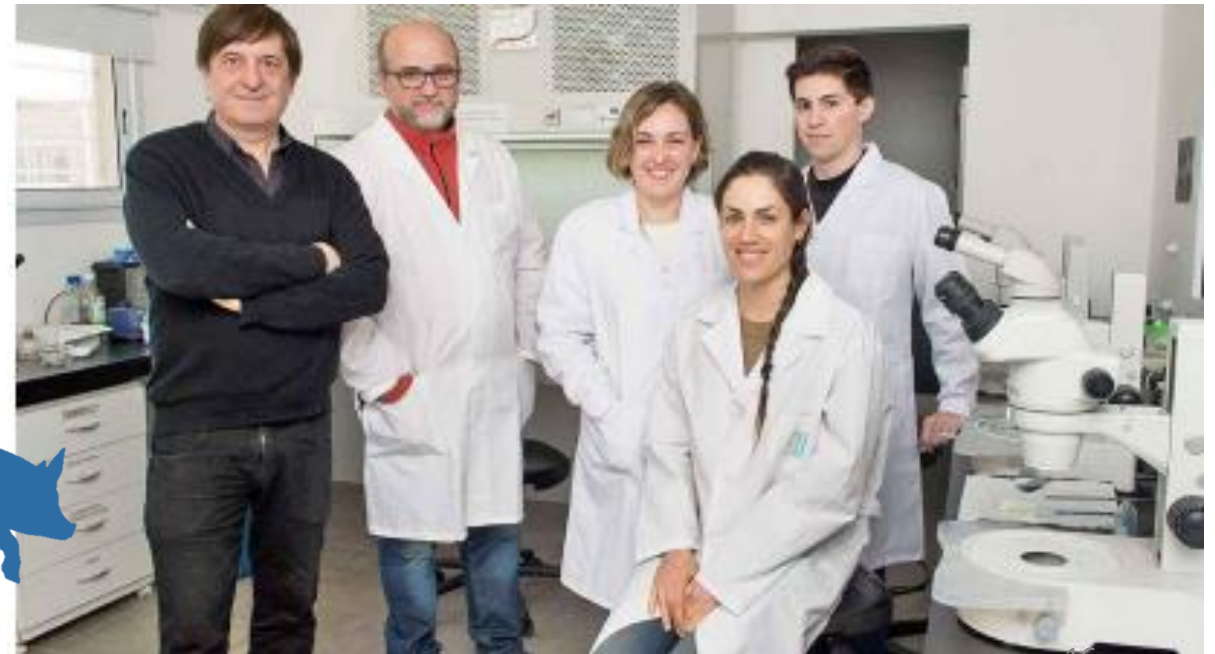
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Transgenic Pig

Xenotransplantation

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2011



2011



Commercial Cloning and GnEd- Equine



CONICET



PUBLIC FUNDS




Gene Editing Regulation and Innovation Economics

Agustina I. Whelan^{1,2}, Patricia Gutti^{1,3} and Martin A. Lema^{2,3*}

¹ Maestría en Política y Gestión de la Ciencia y la Tecnología, Universidad de Buenos Aires, Buenos Aires, Argentina,

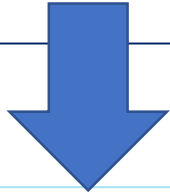
² Dirección de Biotecnología, Secretaría de Alimentos y Bioeconomía, Buenos Aires, Argentina, ³ Departamento de Ciencia y Tecnología & Maestría en Ciencia, Tecnología y Sociedad, Universidad Nacional de Quilmes, Bernal, Argentina



The Argentine **regulatory system** for **modern biotechnology** applied to **agriculture is recognized worldwide** for being among the most experienced ones

2015

Pioneer regulation for products of the so-called “new breeding techniques” (NBTs), including gene (or genome) editing.



First country that enacted regulatory criteria to assess if organisms resulting from new breeding techniques (NBTs) are to be regarded as genetically modified organisms (GMOs) or not.



Genomic Editing: The Evolution in Regulatory Management Accompanying Scientific Progress

María Florencia Goberna, Agustina Inés Whelan, Perla Godoy and Dalía Marcela Lewi*

National Directorate of Bioeconomy, Secretariat of Food, Bioeconomy and Regional Development, MAGyP, Buenos Aires, Argentina

Advantages of Regulatory Framework

Increase the availability of information

**Reduces uncertainty
(developers and users)**

**Facilitates decision process
and diffusion of innovation**

Is a key issue in any country's strategy for economic development

Regulation for gene editing

Improve the predictability of regulatory costs for innovative products.

The investment of **time** and **money** required in order to meet regulatory requirements may be more attainable compared with the option of developing the same traits using GMO technology



Private

Regulatory framework

Public



Harmonious development of biotechnologies and the regulatory framework, coordinating scientific advances, society opinion and greater private interaction

Thanks for your attention

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Instituto de Investigación Animal del Chaco Semiárido

