



Quintil
Valley

CHALLENGE 2

“OPTIMIZATION OF CONCEPTION RATE AND
CLEAVAGE IN IN VITRO FERTILIZATION (IVF)”

CHALLENGE LACTEA

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CHALLENGE 2: OPTIMIZATION OF CONCEPTION RATE AND CLEAVAGE IN IN VITRO FERTILIZATION (IVF)

Identified Problem:

Láctea S.A.'s Sembryo unit is facing suboptimal reproductive rates: a cleavage rate of 20% (target 40%) and an effective pregnancy rate of 12% (target 30%-50%). This significantly affects both operational and economic efficiency.

Main Objective:

Substantially increase the success rate of in vitro fertilization (IVF) by optimizing the current protocols.

Key Success Indicators:

- Increase the oocyte cleavage rate from 20% to at least 40% or higher.
- Improve the effective pregnancy rate from the current 12% to at least 30%-50%.
- Achieve a significant reduction in operational costs related to the entire process of viable embryo production.

Desired Solutions:

- Development and implementation of improved culture media with specific nutrients and growth factors.
- Adoption of advanced artificial intelligence (AI) technologies for predictive selection and enhancing reproductive efficiency.
- Use of innovative genetic and metabolic biomarkers to increase accuracy in embryo selection.
- Comprehensive optimization of current protocols for oocyte maturation, fertilization, and embryo transfer.
- Advanced real-time monitoring systems for critical parameters during embryo development.
- New cryopreservation and thawing techniques to optimize post-storage embryo viability.

Undesired Solutions:

- Isolated or Partial Improvements: Solutions that only address specific areas of the reproductive process without comprehensively improving the entire workflow.
- Solutions Requiring Major Modifications or Significant Infrastructure Expansions: Any solutions that demand substantial changes to the existing infrastructure or operations, which could disrupt the current processes and incur high costs.
- Disruptive Techniques: Solutions that introduce disruptive or overly complex methodologies, potentially complicating the current operational flow and creating unnecessary inefficiencies.

AVAILABLE EQUIPMENT AT THE SEMBRYO UNIT

Equipamiento	Función Específica
CO ₂ Incubator	Maintains the proper temperature and CO ₂ concentration for oocyte maturation and early embryo development.
Gas Mixture Incubator	Controls a specific atmosphere (O ₂ , CO ₂ , N ₂) for optimal conditions during embryo culture.
Inverted Microscopes	Detailed and precise morphological evaluation of oocytes and embryos.
Stereoscopic Microscopes	Direct observation and selection of oocytes and embryos during handling.
Laminar Flow Hood	Sterile environment for safe, contamination-free manipulation of gametes and embryos.
Micromanipulators	Precise techniques such as intracytoplasmic sperm injection (ICSI).
Heating Plates	Ensures proper temperature maintenance during handling and technical procedures.
Ultrasound Machines	Real-time monitoring of follicular aspiration and reproductive evaluation.
Follicular Aspiration Pumps	Efficient and minimally invasive extraction of oocytes through transvaginal follicular aspiration.
Guides and Transducers for Ultrasound	Facilitate precise visualization and extraction of oocytes via ultrasound-guided aspiration.
Cryopreservation Systems	Efficient freezing and long-term storage of viable oocytes and embryos.
Culture Medium Preparation Lab	Accurate and controlled preparation of culture media specific to each phase of the process.