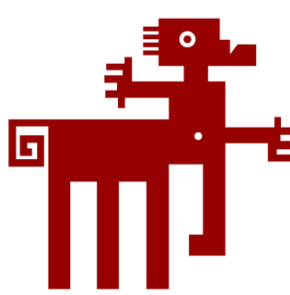


In Vitro Production of Embryos in Small Ruminants

AITOR JIMÉNEZ FERNÁNDEZ · JUNE 2024
Final degree project

UAB
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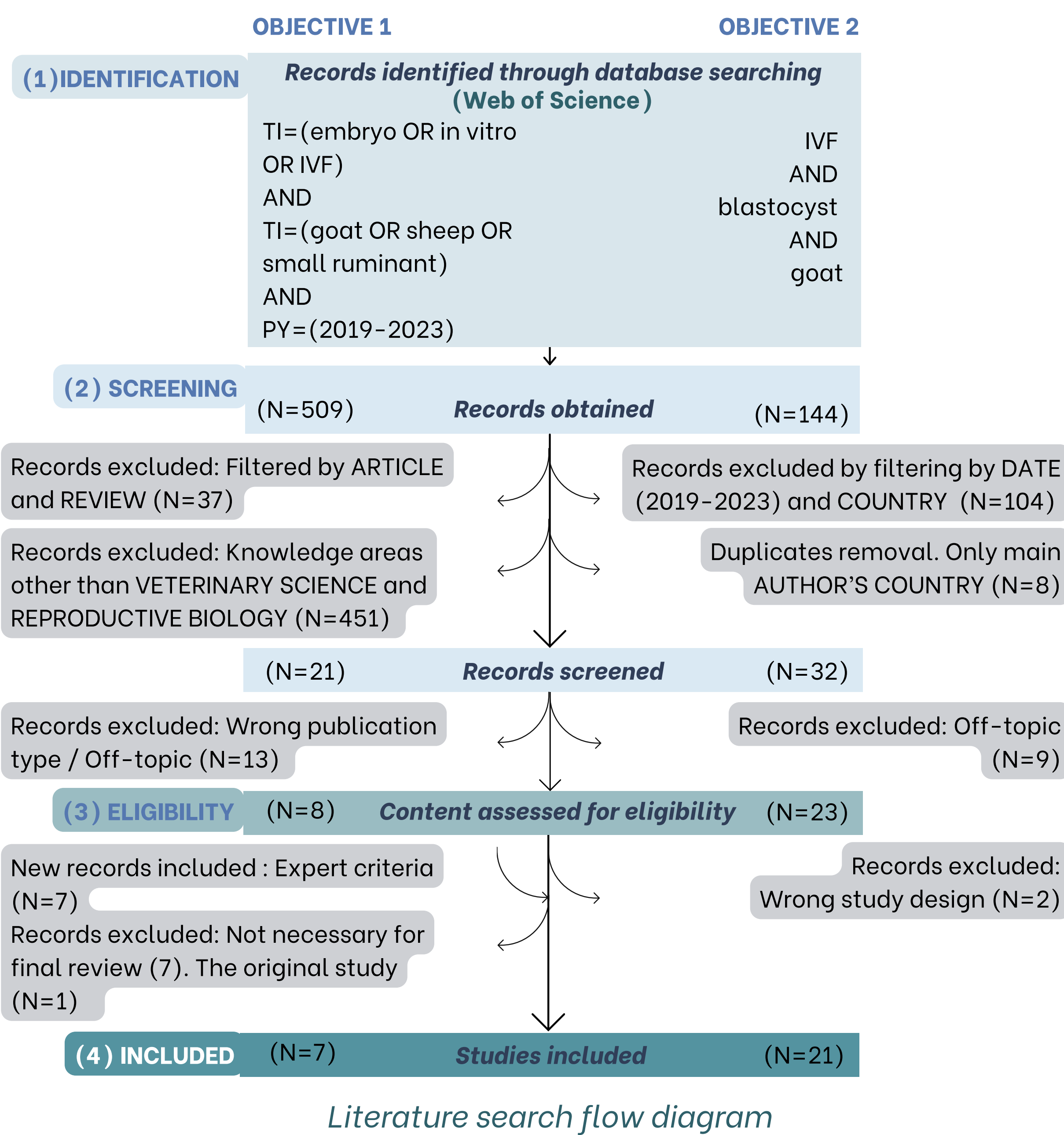


Faculty of Veterinary Medicine

OBJECTIVES

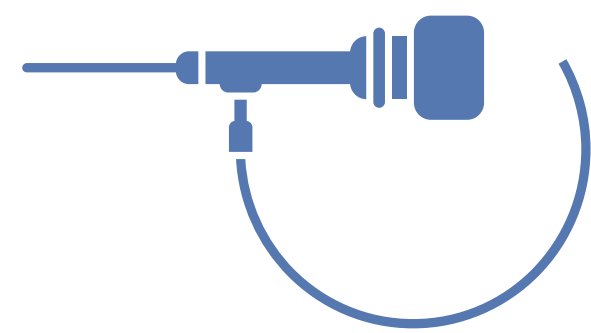
This work aims to update the review of Reproductive technologies in goats published by Paramio, M-T., Soto, S., and Izquierdo, D. in 2020, and to conduct a bibliographic analysis on in vitro fertilization in goats. Two main objectives are proposed: (1) to update previous data, and secondly, (2) to examine the relationship between studies on *in vitro* fertilization in goats and the livestock activity of the countries of origin.

METHODOLOGY



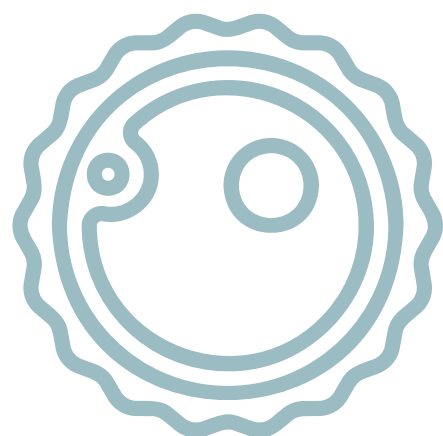
DISCUSSION

Key aspects to improve at each stage of *in vitro* embryo production in small ruminants



(1) OOCYTE COLLECTION

IVEP growth; MOET leading embryo production in small ruminants.



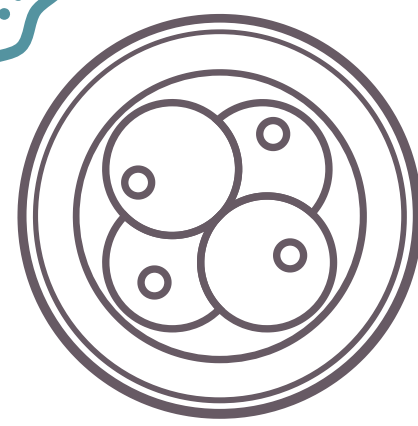
(2) OOCYTE SELECTION / IVM

Results between labs variable and need standardization of IVM protocol/system for each oocyte source.
Meiotic arrest: pre-IVM protocols need improvement.
Follicle cultivation: Challenges in oocyte maturation and blastocyst production.



(3) IVF (*in vitro* fecundation)

Protocols not optimized. Sexed semen not widely used due to high costs



(4) IVD (*in vitro* development)

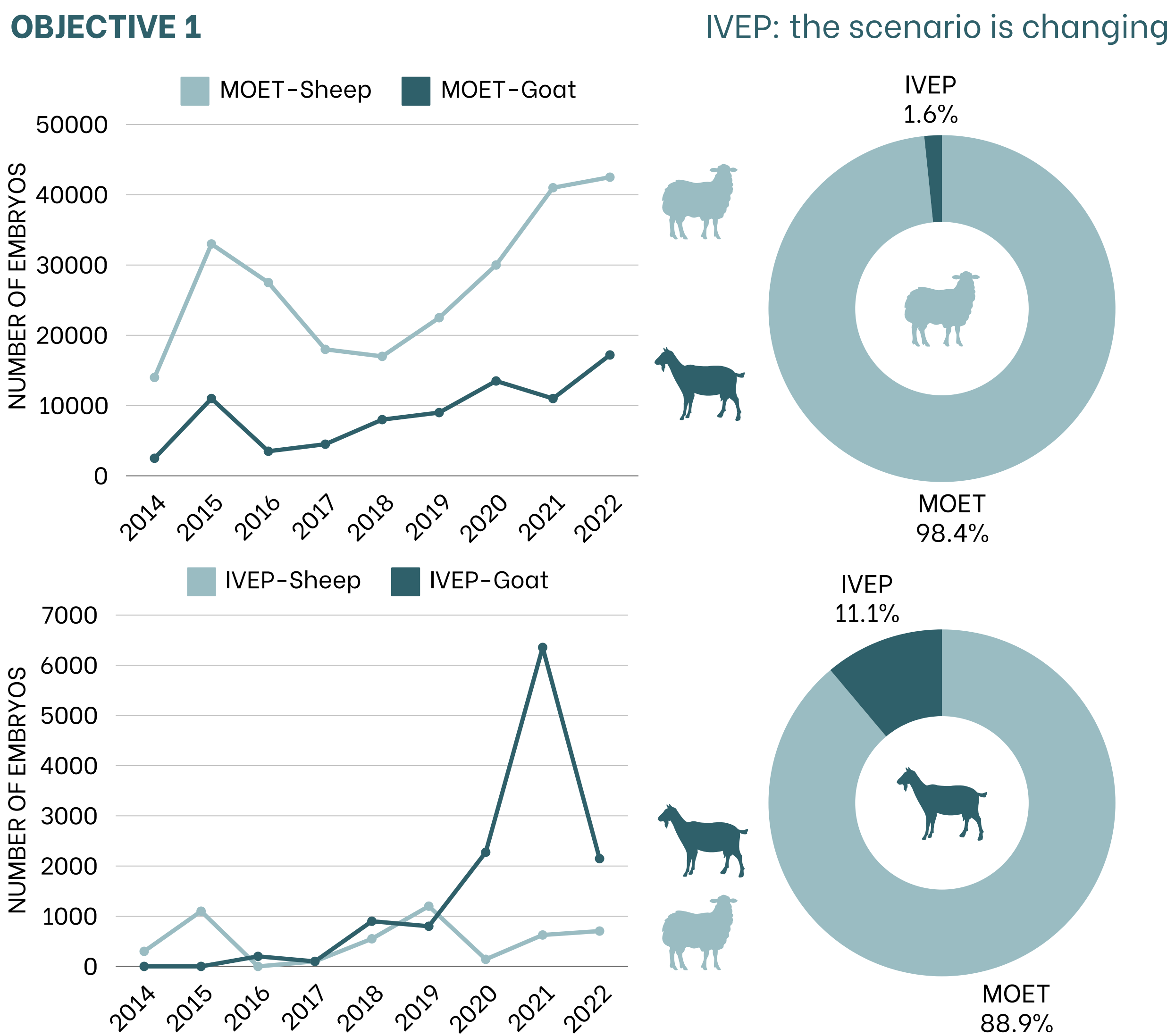
Embryo selection: morphological selection is not as predictive as omics technologies
Transfer and cryopreservation: reliable and practical methodologies needed.

Antioxidant supplementation: further research to improve fertilization and embryo development.

Transgenesis: Low efficiency. Potential transgenic goats for *pharming* and production traits.

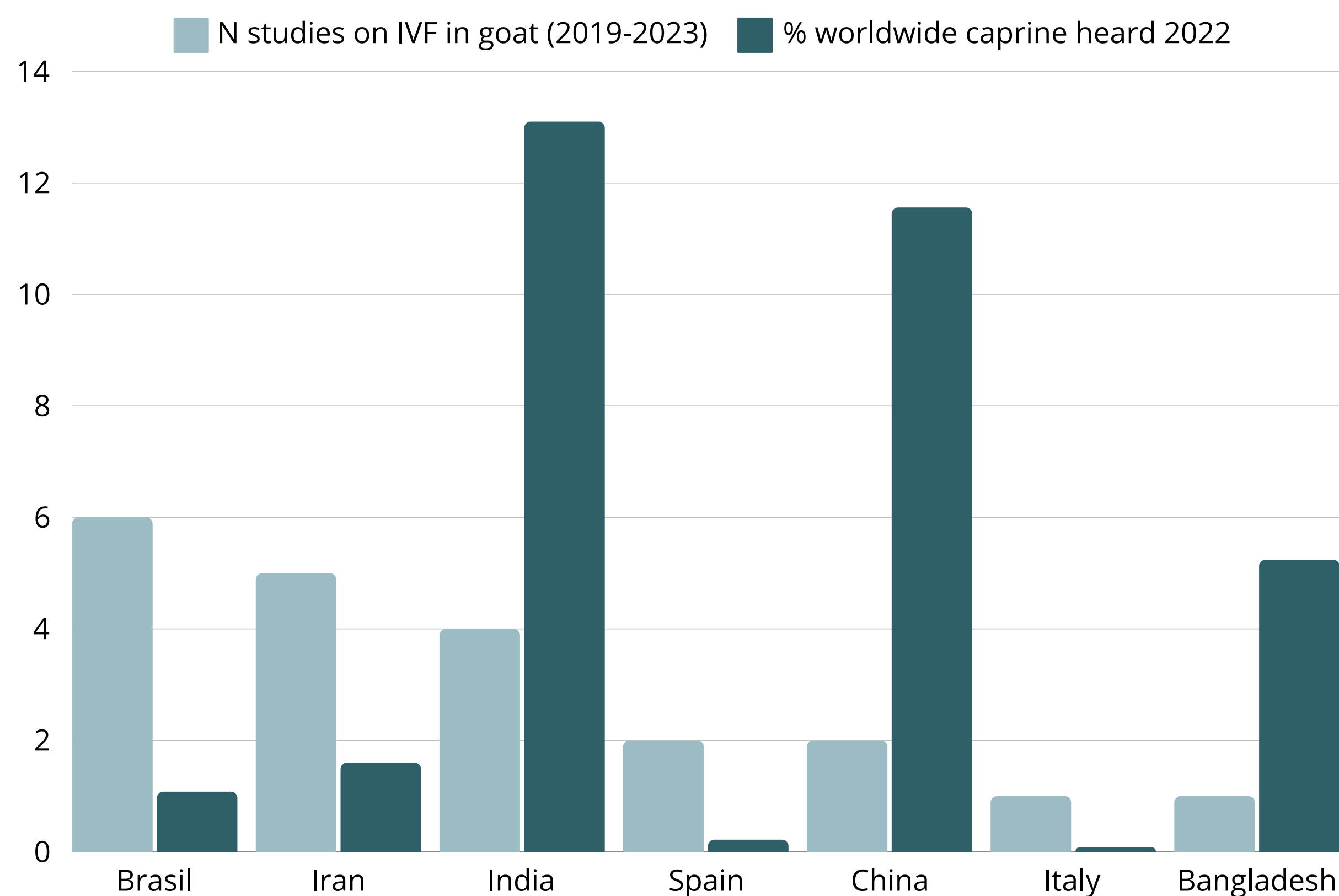
RESULTS

OBJECTIVE 1



OBJECTIVE 2

Relationship between studies and livestock activity



Interest of the scientific community by regions and relevance of these regions in small ruminant livestock production

CONCLUSIONS

- Small ruminants' resilience and easy management are crucial for global subsistence and economies (SDG 2)
- Improved reproductive understanding benefits conservation, genetic enhancement, and productivity.
- ARTs in small ruminants advance reproductive science with less environmental impact.
- Goat production is centered in China and India, but most IVEP research is from Brazil.
- Embryo production and trade are low compared to bovines.
- More research is needed; current findings are preliminary.
- Goat embryo manipulation enables new production methods, such as recombinant proteins of therapeutic utility.

