

ASSISTED REPRODUCTIVE TECHNOLOGY IN BEAR (*URSIDAE*) CONSERVATION

AILUROPODA MELANOLEUCA, URSUS ARCTOS AND URSUS MARITIMUS

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Objective

The *Ursidae* family is severely threatened having 6 of the 8 bear species in danger of extinction. Due to its reproductive physiology characteristics, ursids have a low reproduction rate which aggravates in captivity. It is because of this, that reproductive assisted technology has become a key element in the conservation of this species. The following study is the compendium of the obtained results in this field in three ursid species: giant panda (*Ailuropoda melanoleuca*), brown bear (*Ursus arctos*) and polar bear (*Ursus maritimus*).

Conservational status

Giant panda (*Ailuropoda melanoleuca*)

- "Endangered" (IUCN 3.1).
- 1,000-2,000 animals

Brown bear (*Ursus arctos*)

- "Least concern" (IUCN 3.1)
- Global: 200,000 animals
- Iberian peninsula: 257 animals

Polar bear (*Ursus maritimus*)

- "Vulnerable" (IUCN 3.1).
- 20,000-25,000 animals

Reproductive physiology

Giant panda (*Ailuropoda melanoleuca*)

- Seasonal monoestrous (1-2 days) with mating season in Feb-May.
- Urinary estrogen as ovulation indicator.

Brown bear (*Ursus arctos*)

- Seasonal polyestrous (1-50 days). Mating season varies between regions (from late spring to early summer).
- Fecal estrogen and progesterone as ovarian cycle indicators.

Polar bear (*Ursus maritimus*)

- Seasonal polyestrous with induced ovulation. Mating season in Feb-Apr.
- Testosterone and pregnanediol-3-glucuronide (PdG) in feces useful for reproductive status monitoring.

Common reproductive characteristics

- Delayed implantation
- Pseudopregnancy
- Lactational anoestrus

AI protocols

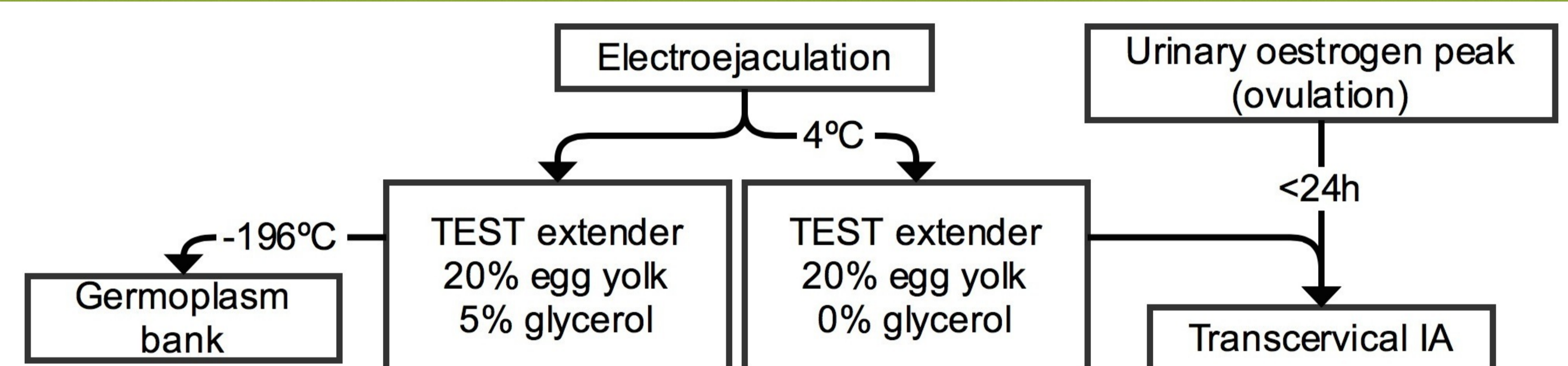


Fig.1 Giant panda (*Ailuropoda melanoleuca*) AI protocol

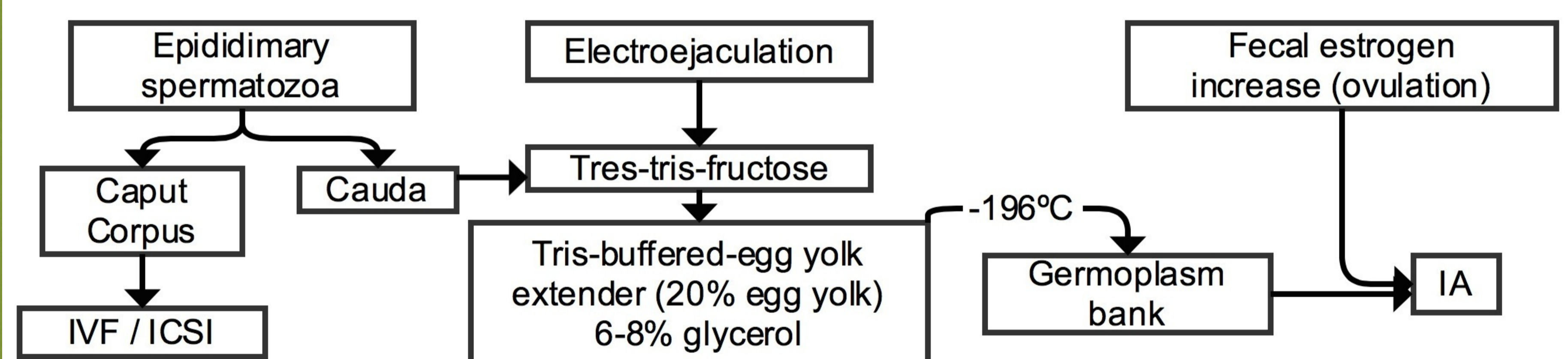


Fig.2 Brown bear (*Ursus arctos*) AI protocol

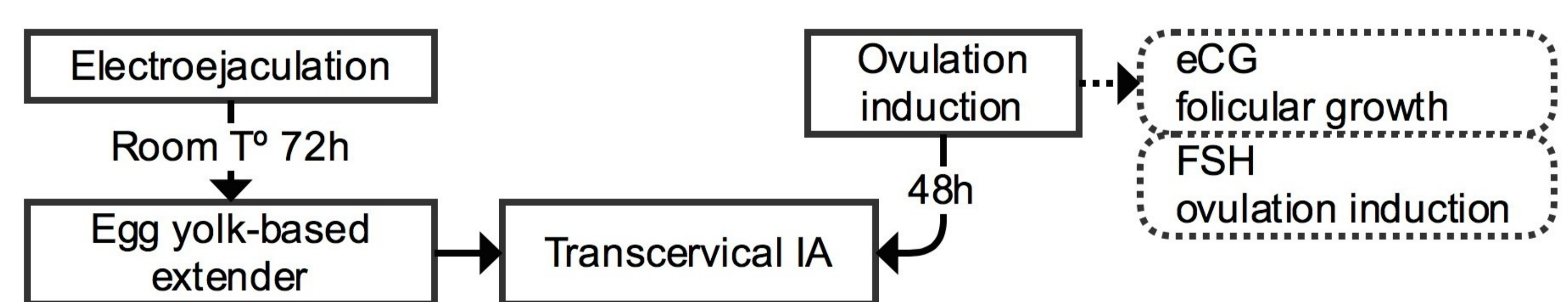


Fig.3 Polar bear (*Ursus maritimus*) ovulation induction and AI performed by Roth et al (2014).

Conclusions

The use of artificial insemination has been a major step in the conservation of ursids, increasing the number of newborn cubs per year. It has also widened the genetic variability of the species in which it is applied by allowing the introduction of genes in the offspring that, by natural mating, would not be possible. The success of the panda bear and iberian brown bear is the example to follow for the rest of bear species, where it is still necessary a deeper understanding of the reproductive physiology to ensure the success of AI.