Assisted Reproductive Technologies in dogs and cats

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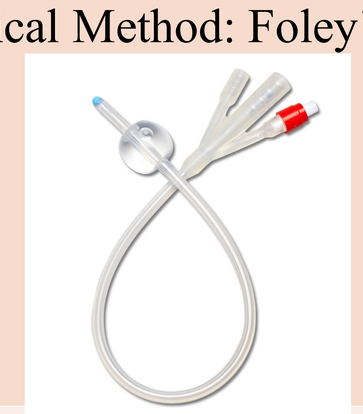
Objective:

This work aims to explain the assisted reproductive technologies that actually exist for the dogs and the cats. As well as the methods with the highest rates of success.

Technics:

Artificial insemination	**DOG**	**CAT**
Female	Radioimmunoassay (RIA): 3 ng/ml starts the ovulation.	Cytology vaginal 80% keratinized cells (oestrus). 
Male: 2nd fraction the ejaculation	Methods: manual, artificial vagina or electro ejaculation	Methods: artificial vagina or electro ejaculation
Insemination technic	Intravaginal → Catheter French tomcat of 3.5mm	Intrauterine → cauterisation trans cervical or by surgery.
Multiovulation and embryos transfer (MOET)		
Super ovulation	Preparation of PAH suspended in 2 ml of saline solution for 10 days. At day 11 a single dose of human chorionic gonadotropin (HCG)	FSH daily, equine chorionic gonadotropin eCG and LH.
Fecundation	Artificial insemination or natural mount	
Collecting embryos	Surgical method: 1. Anaesthesia and Laparotomy and exteriorisation of the ovaries and uterine horns. 2. Wash with Ringer's solution supplemented with 20% of canine serum	Non-surgical Method: Foley's catheter 
Embryos transfer	Transfer to oviduct	Intrauterine transfer
Production of embryos in vitro: IVF and ICSI		
Collecting the oocytes: oophorectomy and work with TALP-HEPES . Oocyte maturation in culture TCM-199 supplemented with FBS 10% and antibiotics. TºC: 38,8 °C inhumidified to 5% of CO2 during 24 h.	Cultivated in isolated oviduct for 24 hours. Cultivated in drops 48 or 72 hours. Resumption of the meiosis after the 72 hours	cultivated in drops during 24 hours at 38°C with 5% CO2 humidity
IVF: 	**Maturated oocytes co-cultivated with enhanced spermatozoids. Hyper activation → caffeine, glutathione or bicarbonate. TALP culture (pyruvate, lactate, BSA, gentamycin and heparin) → acrosome reaction**	
ICSI	**Embryos cultured (IVF and ICSI): Charles Rosenkrans medium enriched with BSA at 38 ° C and 5% CO2 in a humidified air**	
Cryopreservation	**Embryos : in condition of morula and blastocyst**	**Gametes: Oocytes in metaphase II or in germinal vesicle**
Method of freezing	Culture: PBS and glycerol. Introduce it in a straw and lower the temperature until -196°C with liquid nitrogen	
Vitrification	**high concentration of cryoprotectants ethyleneglycol and saccharose. 10 minutes until the equilibrium to -196°C liquid nitrogen.**	

CONCLUSIONS :

- AI:Clinical tool for females and males with difficulties to ride or pathologies of the reproductive tract.
- The *in vitro* maturation of female dogs' oocytes is complicated because they ovulate in germinal vesicle and for them to mature, to mII needs 48 to 72 hours in oviduct.
- Cryopreservation is difficult because of the high presence of lipids in the oocytes. Those technics are experimental and maintain the individual variability.