



Information about ICSI

(Intracytoplasmic sperm injection)

This reproductive technology is now available in New Zealand at EquiBreed ART. It involves fertilisation in the laboratory by injection of one sperm into one egg. The egg is then cultured in the laboratory until transfer or freezing.

The process involves

Oocyte recovery (Ovum Pick Up / OPU)

- Screen mares for suitability for ICSI. Ideally, they have 5-10 follicles on each ovary ranging from 5-15mm in diameter. Ask your vet to scan your mare 2-3 days prior to OPU to confirm follicle numbers before appointment. Your vet can text ultrasound images of ovaries with client & mare name to 021 421 744 for review
- Using a transvaginal ultrasound guided technique, the egg is harvested directly from the follicle of the mare
- This is a standing procedure and typically takes about 45-60minutes
- The mare is sedated and given a rectal relaxant and in some cases an epidural
- There will be drug withholding periods for mares in competition
- The ideal sized follicles for good quality oocytes are 10-30mm
- Normally there is about 50-60% oocyte recovery rate (so if there are 4-10 follicles there should be 2-5 oocytes recovered)
- OPU is performed between 11am and 3pm on Tuesdays and Wednesdays. Bookings are essential



In vitro culture (in the lab)

- The oocytes are then matured in the laboratory for 28hours before fertilisation
- A very small volume (<0.1ml) of sperm is processed for the procedure
- Fresh, chilled or frozen sperm can be used
- One sperm is selected under the microscope for the injection of each oocyte
- The injected oocytes (now called zygotes) are cultured in the laboratory for up to 10 days prior to non-surgical transfer or freezing

What results can we expect? under ideal conditions:

- Oocyte recovery rate 50-60% of follicles aspirated (eg: 5 oocytes from 10 follicles)
- Oocyte maturation rate 80% (eg: 4 oocytes)
- Cleavage (cell division) rate after injection 50% (eg: 2 oocytes)
- Blastocyst production 10-30% of oocytes recovered (eg: 1 blastocyst)

Factors that affect success rates

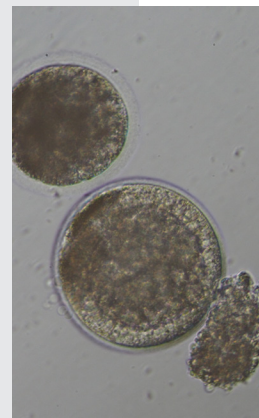
- Number and size of follicles available for aspiration
- Age of the mare – younger is better
- Heat stress – keep your mares cool
- Seasonal factors – better results may be autumn, winter, spring rather than mid-summer
- Stallion fertility (including batch variation)
- Laboratory conditions
- Pregnancy loss between day 15 and 60 of gestation can be up to 20% of ICSI pregnancies compared with 12% of in vivo (regular) pregnancies

Benefits

- Walk in walk out procedure for local mares
- Maximises use of sperm (especially frozen sperm)
- The procedure works all year round as long as there are follicles present
- Options to use multiple stallions
- Can be repeated at 2-4 weekly intervals to maximise recovery rates
- Can be easily arranged to avoid competition schedules
- Works well on a “service fee when pregnant” basis
- Mares can continue with training and competition during their breeding programme
- Embryos can be frozen with >60% survival rates after transfer to improve recipient management and reduce costs
- Can be used as a fertility treatment for problem mares or stallions
- Costs per embryo will be similar to current embryo programmes
- Efficient use of recipient mares when using frozen embryos

Disadvantages

- Sedation may have withholding periods (up to 8 days) to consider in competition mares at FEI level, but training can continue uninterrupted
- Involves rectal palpation and transvaginal techniques with risk of infection or perforation of the rectum
- Mares may be treated with antibiotics for 3 days after the procedure
- Some mares produce more or less eggs / embryos than others
- Some stallions will not be suitable for use in the procedure
- It is biology and not all mare x stallion combinations are going to work
- Environmental factors that affect fertility eg: exposure to toxins, estrogens, heat stress will still have detrimental effects on the outcome



Current status

We have now confirmed live foals born and more foals due this season. These pregnancies are produced from both fresh and frozen ICSI embryos. Analysis of our results since March 2020 shows that 62% of OPU sessions produce an embryo. Some of these sessions have produced multiple embryos so that on average we have 1.1 embryos per ICSI run. Our results are improving all the time, but there are still some mares that fail to produce an embryo and other mares that produce multiple embryos. We recommend allowing for 2-3 OPU cycles to establish a pregnancy.

Frozen embryo results to date

Over the last 3 years, our in vivo frozen embryos have 73% survival after transfer which is comparable to the survival rates of 78% for grade 1 in vitro (ICSI) frozen embryos. There is some pregnancy loss up to day 55 of gestation, so that the final pregnancy rate is 67%. In 2019 our survival rates after embryo transfers with fresh in vivo derived embryos were 87%.



For more information contact us today

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