ICSI: An Introduction

WHAT IS ISCI?

- ICSI is the injection of a single sperm into a mature oocyte (eggs) in the laboratory using micromanipulation techniques.
- ICSI provides a means of overcoming the problems of IVF in horses.
- Clinical use of this technology provides a means of producing foals from sub fertile mares and stallions and assists in rescuing the fertility of aged mares and stallions.
- ICSI employs ovum pick up (OPU) of mature oocytes (eggs) from the donor mares by follicle aspiration.
- OPU can also harvest immature oocytes and those eggs can be cultured in the lab until they become mature oocytes (metaphase ll).
- The mature oocytes are then injected with a single sperm cell using micromanipulation techniques.
- The resulting fertilized egg is cultured in the lab until it reaches the expanded blastocyst stage (day 6,7,8, or 9)
- The embryo can then be transferred non-surgically to a recipient mare (preferably 5 days post ovulation) or frozen for use later.
- The loss of fertility associated with aged oocytes can be overcome with ICSI.

The technology of Intracytoplasmic Sperm Injection (ICSI), used in human fertility clinics has now been applied to horses. The miracle of producing a foal from an infertile mare or salvaging many foals from one straw of semen from a deceased stallion are now possible. What originally began as academic research has now reached the point of commercial application in a few private veterinary hospitals specializing in equine reproduction.

Colorado Sate University and Texas A&M are the primary centers of research in equine reproduction. Due to the investment in laboratory facilities, equipment and supplies, which can easily reach several hundred thousand dollars, in addition to the learning curve of several years, there are only a couple of private veterinary hospitals offering these services. Dr. Rob Foss at Equine Medical Center in Columbia, Missouri and Dr. Rick Beck at IN Foal, Inc. in Hemet, California are the two hospitals that have produced several live foals by this procedure.

After collection an oocyte (horse egg) from a follicle on the mares ovary, a microscope with micromanipulators is used to mechanically inject one sperm cell into the egg. After 8 days in the incubator, the embryo is transferred into the uterus of a recipient mare (serrugate mother) that

will give birth 11 months later. The application of this cutting edge technology has produced foals from outstanding genetic individuals that otherwise would have been lost to the gene pool.

Information Courtesy of Dr. Rick Beck, InFoal Inc.