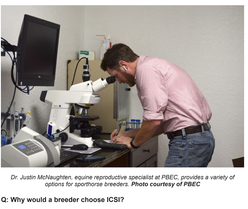
ICSI in Sport Horse Breeding: Your Questions Answered

Modern reproductive technology offers new possibilities for sport horse breeders, especially those working with valuable mares and stallions. One of the most exciting advancements is intracytoplasmic sperm injection, or ICSI. But what exactly is it, and why are more breeders choosing it? With insights from Dr. Justin McNaughten, BVMS; DACT, the equine reproductive specialist at Palm Beach Equine Clinic (PBEC) in Wellington, FL, this guide will help explain how ICSI works and what it means for your breeding goals.

Q: What is ICSI, and how is it different from traditional breeding?

ICSI stands for intracytoplasmic sperm injection, a technique where a single sperm cell is injected directly into an egg to create an embryo. This differs from traditional breeding or embryo transfer, in which a mare is inseminated, and the embryo develops naturally within her reproductive tract.

ICSI was first used successfully in horses in 1996 and was originally developed to help mares and stallions with fertility challenges. Today, it has become an *increasingly popular option* for sport horse breeders seeking greater flexibility and higher success rates in certain situations.



Dr. Justin McNaughten, equine reproductive specialist at PBEC, provides a variety of options for sporthorse breeders. ***Photo courtesy of PBEC***

Q: Why would a breeder choose ICSI?

ICSI offers several important advantages. One of the main benefits is that it requires only one sperm to fertilize an egg. In conventional breeding, a single insemination dose may require hundreds of millions of sperm. This makes ICSI especially valuable when using frozen semen from deceased stallions or stallions with very limited semen availability.

ICSI is also helpful for mares that cannot carry or produce embryos through traditional methods due to reproductive tract issues. Because the eggs are collected directly from the ovaries, the procedure bypasses many of the structures that might otherwise prevent successful breeding.

Another major advantage is flexibility. Unlike traditional breeding, ICSI can be performed regardless of where the mare is in her reproductive cycle. This allows competition mares to stay in training and maintain their show schedules with minimal disruption.

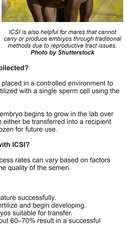
A microscopic view of an ICSI procedure is shown here. ***Photo courtesy of PBEC***

Q: How are the eggs collected from the mare?

The first step in ICSI is collecting the eggs, also called oocytes, from the mare's ovaries. This procedure is performed at PBEC while the mare is safely sedated and standing comfortably.

Using ultrasound guidance, the veterinarian locates the follicles on the ovary that contain the eggs. A specialized needle gently collects fluid from the follicles. The eggs are then retrieved from the fluid, carefully prepared, and sent to a specialized laboratory for the next stage.

Most mares tolerate the procedure well. They typically stay overnight for observation and are often able to return to normal work within about a week.



ICSI is also helpful for mares that cannot carry or produce embryos through traditional methods due to reproductive tract issues. ***Photo by Shutterstock***

Q: What happens after the eggs are collected?

Once the eggs arrive at the lab, they are placed in a controlled environment to mature. After maturation, each egg is fertilized with a single sperm cell using the ICSI technique.

If fertilization is successful, the resulting embryo begins to grow in the lab over the next 7 to 10 days. At that point, it can either be transferred into a recipient mare, who will carry the pregnancy, or frozen for future use.

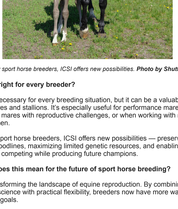
Q: What are the chances of success with ICSI?

As with any reproductive procedure, success rates can vary based on factors like the mare's age, overall health, and the quality of the semen.

On average:

- About 50–60% of collected eggs mature successfully.
- Of those, approximately 70–80% fertilize and begin developing.
- Around 20–30% develop into embryos suitable for transfer.
- When embryos are transferred, about 60–70% result in a successful pregnancy.

These numbers show that while not every egg becomes a foal, ICSI provides significant opportunities for success — especially in cases where traditional breeding might not be possible.



For many sport horse breeders, ICSI offers new possibilities. ***Photo by Shutterstock***

Q: Is ICSI right for every breeder?

ICSI isn't necessary for every breeding situation, but it can be a valuable tool for certain mares and stallions. It's especially useful for performance mares still competing, mares with reproductive challenges, or when working with rare or limited semen.

For many sport horse breeders, ICSI offers new possibilities — preserving valuable bloodlines, maximizing limited genetic resources, and enabling mares to continue competing while producing future champions.

Q: What does this mean for the future of sport horse breeding?

ICSI is transforming the landscape of equine reproduction. By combining advanced science with practical flexibility, breeders now have more ways to reach their goals.

Whether preserving the legacy of a legendary stallion or planning the next generation of elite competitors, ICSI is making sport horse breeding more accessible, efficient, and innovative than ever.

Palm Beach Equine Clinic is here to help you achieve your breeding objectives. Our veterinarians specialize in breeding and reproduction and utilize the latest technology to ensure a seamless experience for both you and your mare. Contact us today at 561-793-1599 to schedule an appointment or learn more at www.EquineClinic.com.

How PBEC Can Help

AGDF 7 Winners

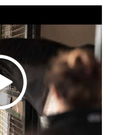
Triumphing in both CDIYH 7-Year-Old classes were Karen-Lipp (USA) and Soho, owned by Katharine McQueen, and they were presented as winners by judge Elisabeth Max-Theurer and Dr. Jennifer Ray of PBEC. ***Photo by Centre Line Media***

Svenja Grimm (CHI) and Ein Quirotchen Glück, owned by Grimm and Mario Vargas, scored a personal best of 81.300% on their way to winning both CDIYH tests for 6-Year-Olds and stood for their presentation with Dr. Jennifer Ray of PBEC and judge Miguel Conçalves. ***Photo by Centre Line Media***

Laura De Cesari (USA) and VP Ice Man, owned by Valiente Partners LLC, led both classes for CDIYH 5-Year-Olds and is shown here with judge Elisabeth Max-Theurer and Dr. Jennifer Ray of PBEC. ***Photo by Centre Line Media***

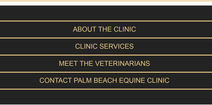
AGDF 8 Winners

Caroline Roffman (USA) and Onassis, owned by Hyperion Farm Inc., scored a personal best of 76.847% to win the CDIYH Preliminary Test for 7-Year-Olds, pictured here with judge Dr. Eva Eisenhardt and Dr. Claire McDonald of PBEC. ***Photo by Centre Line Media***



With a personal best of 76.343%, Jennifer Hoffmann (USA) and Fandiamo 4, owned by Hof Kasselmann GmbH & Co. kg, won the CDIYH Final Test for 7-Year-Olds. They were presented as winners by judge Katrina Wüst and Dr. Claire McDonald of PBEC. ***Photo by Centre Line Media***

Palm Beach Equine Clinic: Make Us a Part of Your Team



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