



THE LAST STRAW

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What should you do when you have used all but the last straw of frozen semen from a valuable stallion that is no longer alive or no longer able to be collected? A traditional breeding dose may consist of anywhere from one to eight straws (0.5 ml each), depending on how the semen was frozen. In addition, mares are commonly bred with 2 doses of frozen-thawed semen, one dose just prior to the anticipated ovulation and one dose after ovulation has been confirmed. Pregnancy rates for mares bred with two doses of frozen-thawed semen range from 35 to 50 percent per cycle. Consequently, a single straw of frozen semen would typically constitute only part of a breeding dose and is not likely to result in a pregnancy if used with traditional insemination techniques.

So what can you do? Low-dose insemination techniques utilizing a videoendoscope or ultrasound-guided deep uterine insemination may be used to deposit semen near or directly onto the opening of the oviduct at the tip of the uterine horn. Sperm deposited at the opening of the oviduct, also known as the uterotubular junction (UTJ), will swim up the oviduct and hopefully locate and fertilize an egg or oocyte. A single 0.5-ml straw of semen frozen will usually contain a minimum of 50 to 60 million motile sperm. Low-dose insemination techniques using 5 to 25 million progressively motile sperm have

been reported to achieve a 40 to 50% pregnancy rate. Therefore, a single straw of frozen semen may be able to successfully impregnate a mare using a timed low-dose insemination technique.

Should you use the last straw on one mare? Once you thaw the semen, it's gone forever...or is it? A recent study at Colorado State University demonstrated that frozen stallion semen could be thawed and refrozen and still retain over 70% of its initial post-thaw motility. The study further demonstrated that a single 0.5-ml straw of frozen semen containing 200 million sperm could be thawed, diluted in additional freezing extender and refrozen in up to 2,000 smaller (0.25-ml) straws containing 100,000 sperm per straw. Approximately 33% of the refrozen sperm at that concentration were motile when thawed for the second time. If you do the math correctly, that would equate to about 33,000 motile sperm per straw.

As assisted reproduction techniques that require very limited numbers of sperm are developed and refined in the horse, that single straw of frozen semen could be used to produce many future foals. For example, intracytoplasmic sperm injection (ICSI) is a technique in which a single sperm is injected or deposited within the cytoplasm of an egg (oocyte) that has been collected from the

ovary of a mare prior to ovulation. The injected oocyte may be either transferred surgically into the oviduct of a recipient or surrogate mare or may be cultured for several days and then transferred non-surgically into the uterus of a recipient. Sperm injection is a common procedure for obtaining pregnancies in subfertile human couples. Several foals produced by ICSI have now been born.

In conclusion, it is recommended that you hold on to that last straw and wait for critical advances in reproductive technology to become available so that the remaining spermatozoa can be used judiciously. If you have a valuable stallion and have not yet stockpiled frozen semen for future use, do it soon while you still have a chance. Frozen semen may last forever, stallions don't.