

# The Big thaw



An insulated liquid nitrogen flask used to store frozen semen

Fresh, chilled — or frozen? If you're contemplating artificial insemination, what should you opt for, asks

CAROLE MORTIMER

**A**LTHOUGH not permitted in the breeding of Thoroughbreds destined for the racetrack, the use of artificial insemination (AI) with fresh, chilled or frozen semen has become widespread in the breeding of sport horses. The Netherlands, for example, breeds almost 14,000 sport horse foals each year using AI. "All have their uses," says Tullis Matson of Stallion AI Services Ltd. "There is no doubt that fresh AI is the best and, in the right circumstances, chilled does the job very well, but the use of frozen semen has improved on many different levels: technique, deep uterine insemination by the vet, timing and awareness of need for the right mare."

Most semen is used chilled — taken from the stallion to order, cooled and delivered within 24hr to be inseminated. Apart from issues of variable quality control, the problem with chilled semen is that you are at the mercy of the courier service.

Frozen semen is becoming more popular with stallion owners, as it can be collected at convenient times, leaving the stallion to concentrate on competition during the busy



Sarah Cohen on young horse champion Treason, a four-year-old bred using frozen semen

stud season. It also offers mare owners greater flexibility in that it can be ready to use in synchronisation with the mare's ovulation.

As Dr Jonathan Pycock MRCVS puts it: "With frozen semen, the semen is waiting for the mare, whereas with chilled semen, the mare is waiting for the semen."

The downside is that frozen semen has a much shorter life after thawing — just hours rather than days — and, therefore, a much shorter time span of fertility. In the past, this has led to lower results in terms of conception. In a letter to *Horse & Hound* in April 2005, Professor Twink Allen FRCVS of the Equine Fertility Unit in Newmarket blamed its use for the lack of fertility in sport horse mares undergoing embryo transfer.

"The use of frozen semen got off to a bad start," says veterinary surgeon and freezing expert Martin Boyle MRCVS of Stallion Reproduction Services. "Initially, users adopted successful techniques from the cattle industry, which simply didn't suit horses. Added to this, the belief that frozen semen was not suitable was made strongly by the Thoroughbred industry, which simply didn't want AI."

## Things are getting better

VETS from Willesley Equine Clinic, Tetbury, Gloucestershire, are keen to change the perception that using frozen semen means a lower rate of success. A report written by the stud vets from the clinic, based on statistics from last year's stud season (see box), demonstrates that they achieved a greater conception rate using frozen semen than with chilled. The results with frozen semen were similar to those achieved in Thoroughbred studs.

"Our results have proved that good conception rates are possible, but they do reflect the effort needed in terms of intense veterinary management and time," says Chris Shepherd MRCVS, one of the vets involved in the study.

## Quality control

ANOTHER factor that originally resulted in low success rates was the lack of skill in freezing the product.

"Frozen semen is definitely different in its behaviour from fresh or chilled. The survival rate of sperm after freezing is much reduced," says Martin Boyle. "And not every stallion produces semen suitable for freezing."

According to Martin, there is no indication under the microscope as to how fresh semen will react once it has been frozen and thawed. The only way it can be assessed is to freeze and thaw a sample of each ejaculate.

"A stallion's semen can vary from day to day even and, if it doesn't come up to standard, then it must be thrown away," says Martin.

There is now an agreed acceptable

## LONG-DISTANCE RESULTS

■ AT the beginning of 2006, the West Kingston Stallion Centre exported frozen semen from the pony stallions Strinesdale Matador and Westacre Concerto to a client in South Africa. Four pony mares were inseminated and successfully scanned in-foal on the first cycle; subsequently, last December, four pony foals were born (Dibynn Secret Garden is pictured right) — a 100% success rate.

"The UK requirements for semen export to South Africa are stringent and are then followed by the retesting of the semen locally for EVA. The first two mares to each stallion have to breed under strict EVA quarantine requirements, but it was all worthwhile," says breeder Di Nicholson.



A frozen semen foal by Strinesdale Matador

minimum that at least 30% of the sperm must be motile (moving progressively forward) after thawing. While in the UK this is a recommendation by the British Equestrian Veterinary Association (BEVA) Codes of Practice, in countries such as the Netherlands and Germany it is a statutory limit.

## Mare management

WHILE research has led to an increase in the understanding of frozen semen, consistent results were previously disappointing because relatively few vets were experienced in dealing with the thawed product and the time constraints of insemination. Constant monitoring of the mare by ultrasound also proved an added expense for owners. Now better results have been achieved thanks to improved understanding and skill in mare management during oestrus, combined with better insemination techniques, such as deep uterine insemination.

"Owners are beginning to have much more confidence in frozen semen," says Martin.

Leicestershire-based Jenny Bourquin specialises in breeding Holsteiners and puts five or six of her 11 broodmares in-foal every year using imported frozen semen under supervision from Chris Shepherd.

"The quality of semen from Holstein is well controlled," says Jenny. "If you have a good vet, your mares are healthy and their cycle well monitored, it is straightforward."

Jenny makes the point that frozen semen can be stored ready for use, while availability of chilled semen — which has to be ordered to coincide with the mare's ovulation — can be restricted due to a lack of weekend courier services. This means chilled semen, unless collected from the airport, can be almost 48hr old by the time it arrives and, therefore, towards the end of its life.

While it is acknowledged that the use of frozen semen has a greater success rate on younger, more naturally fertile mares, Jenny has successfully used it in a 19-year-old.

"Frozen semen is expensive for the owner in terms of veterinary management, so we would really only recommend it as suitable for mares of optimal fertility — usually between the ages of three and 15," says Chris Shepherd. "But if the mare is healthy and has a good breeding record, then it can work."

Jenny points out that frozen semen from

German stallions is good value.

"There are few world-class jumping stallions here and those that are, are expensive — I feel the English tend to overprice their stallions," she says.

Following the progress that has been made over the last couple of years, Professor Twink Allen has reappraised his opinion: "I am happy to retract the scathing remarks I have made previously about frozen semen in view of the marked improvements in the past two to three years, provided the frozen semen is of good quality and was frozen well. What is desperately needed is some method of regulating the quality of the frozen semen sold. Whereas most British frozen semen is very good — people like Martin Boyle at West Kingston only let out semen that freezes well and retains high fertility — but the same can't be said for some of the frozen semen coming from Europe, especially."

"In Europe there are more well-established freezing units and they are doing a lot more of it very well, but there are always going to be occasional bad apples and sadly that's what everyone remembers," says Tullis Matson. "We receive semen from Europe, the Middle East and from the US and the standards are generally good."

The debate looks set to continue. *H&H*

## The Willesley report

■ THE Willesley vets achieved a total 89.3% pregnancy rate from 56 mares (over three cycles) using frozen semen, compared with a 79% overall pregnancy success rate from 38 mares with chilled semen over three cycles. A look at the figures of success rates on the first cycle, a common indicator of fertility, shows that the use of frozen semen achieved 60.7%, while results on the first cycle for chilled semen were 55.3%.

West Kingston Stud in Wiltshire has demonstrated first cycle rates of 67% with frozen semen — close to those achieved by natural covering. A paper presented by Professor Allen in 2005 of conception rates in Thoroughbred studs shows a 64% conception rate per cycle and a 90% overall success rate.

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