

New system improves the quality of frozen horse sperm

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Cryopreservation is a freezing method of storing spermatozoa to be used for reproduction. Although it is widespread, there is an issue with the ice formation that occurs during the process, which ends up affecting sperm structure and quality. In order to diminish this problem, permeable cryoprotectants are used. These are substances that penetrate tissues and act inside cells in order to stop ice crystals from forming when temperatures go down.

Though these kinds of substances improve the process, they are far from perfect. Upon entering a cell, they damage the [sperm](#) membrane and cause permanent damage affecting fertility. The Veterinary Reproduction research group from the University of Cordoba Animal Medicine and Surgery Department has developed an alternative that improves the quality of spermatozoa when they are frozen. After researching with a group of samples of horse sperm provided by the Centro Militar de Cría Caballar de Ávila (Avila's Horse Breeding Military Center), the research group opted to use a different, less invasive kind of cryoprotectants.

These kinds of impermeable cryoprotectants protect the spermatozoon, but instead of acting on the inner part, they act on the external part of the cell. Specifically, the researchers used protectants made up of Bovine Serum Albumin (BSA) -an antioxidant protein- and sucrose, a sugar whose main function is to increase viscosity and dehydrate the cell, which in turn decreases [ice formation](#) that happens in the freezing process.

Lead author César Consuegra says, "Once we determined the appropriate concentration of this cryoprotectant that had to be used, we observed that the results were similar or even better than when using glycerol, the traditional permeable cryoprotectant." In addition, the research group has determined that this new method better protects the acrosome, a small deposit located at the tip of the spermatozoon that contains certain enzymes.

The group's next challenge, according to its members, is to employ these same cryoprotectants using vitrification, a freezing [method](#) in which the sample is directly put in liquid nitrogen and the drop in temperature is much faster compared to other conventional methods. In this way, even less harm would be done to the sperm.

More information: C. Consuegra et al, Stallion sperm freezing with sucrose extenders: A strategy to avoid permeable cryoprotectants, *Animal Reproduction Science* (2018). [DOI: 10.1016/j.anireprosci.2018.02.013](#)

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