

Researchers report technique for freezing and preserving genetically enhanced pig embryos

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Researchers led by a University of Missouri-Columbia professor of reproductive biotechnology have reported success in freezing and preserving swine embryos that were created by in vitro techniques and that carried modified genetic material. After thawing and transfer to a surrogate mother, some of the embryos went on to produce live piglets with new genetic traits.

In a paper posted today (May 3, 2006) on the Web site of Biology of Reproduction--Papers in Press, a team headed by Dr. Randall Prather, co-director of the National Swine Resource and Research Center, note that their technique could prove valuable in allowing genetically enhanced swine to be transported as embryos across the country and throughout the world.

Because many embryos are needed to produce a successful pregnancy in surrogate female pigs, this new procedure will enable workers to collect an adequate number of altered embryos and store them until they can be transplanted to a surrogate.

Swine embryos have been difficult to freeze and preserve because of their sensitivity to cold due to a high level of lipids in the cells of the embryos. It was expected that it would be even more difficult to freeze and preserve swine embryos that had been produced by in vitro methods.

Dr. Prather's team overcame the obstacles to freezing swine embryos by first removing lipids from unfertilized eggs before fertilizing them with muscle cells from a male pig containing modified genetic material. The resulting embryos were then frozen at the blastocyst stage.

Upon thawing, embryos were transferred to surrogate female swine. Embryos placed in the oviducts of two surrogates led to pregnancies that produced two piglets in one litter and eight piglets in another.

Testing confirmed that the piglets carried the modified genetic material and that the new gene had altered the fatty-acid content in tissues from the piglets.

With ten piglets from 163 frozen and preserved embryos, the researchers feel that their procedure appears to work well, although further studies will be needed to refine the technique.

Dr. Prather and his team expect that freezing and preserving swine embryos will enable wide dissemination of swine with genetic traits that are commercially valuable and also important for biomedical research involving this increasingly relevant animal model for human disorders.

Source: Society for the Study of Reproduction

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