

HEALTH MATTERS

Going, Going, Gone?

Frozen semen allows male dogs to produce pups long after their life ends. Could frozen ovaries offer breeders the same opportunities to extend the reproductive lifetime of females?

Born from frozen semen, "Jackie" practices flying. Photos courtesy of Tex and Patty Ann Peel.



Future Trends in Canine Reproduction

Dr. Robert V. Hutchison of the Center for Canine and Feline Reproduction and Infertility, Inc. discusses the future potential for freezing ovaries in canines.

Unlike humans, the bitch does not go into menopause. Due to the uniqueness of a bitch's estrous cycle, progesterone causes inflammatory changes to the endometrium of the uterus. These inflammatory changes reduce a bitch's potential for reproduction dramatically by six years of age. Her ovaries, however, continue to produce viable eggs throughout the bitch's lifetime. Since the uterus is the weak link in a bitch's reproductive success while the ovaries continue to function, is there a place for

freezing a bitch's ovaries for possible use in the future?

There are current thoughts in human medicine that, for future use, it may be better for a woman to freeze her ovaries rather than her eggs. The ovary is a much larger source of potential ova. Cryogenically storing ovaries was initially developed for women undergoing cancer therapy who desired to reproduce in the future. The practice is now being used in individual's desiring to have babies at a later age while preserving the potentials of a "younger" ovary.

Frozen ovaries are not being used successfully in the bitch at this time. The development of in-vitro fertilization, embryo transfer, and the use of the ova from a frozen ovary has been hindered by the biologic differences of a bitch's estrous cycle when compared to other domestic species. While other domestic species ovulate into an estrogen environment, the bitch releases her ova into a progesterone rich environment. This fact makes it difficult to directly apply research and clinical

advancements that were developed for other species to the bitch. This was one of the hindrances to the development of cloning for the canine when cloning was progressing so rapidly and successfully in other species.

When the frozen ovaries from the bitch are eventually used, the possible methods for success could involve using "sheets" of the frozen ovary and applying them to an intact ovary for revascularization and restoration of function, the "piggy backing" of the thawed ovary or a portion of it onto a functional ovary with extraction of oocytes, or the growing of the ovarian tissue in a cell media for extraction of the ova for in-vitro or assisted fertilization. The frozen ovary may also supply cells for eventual cloning.

The current method used for ovarian freezing involves the removal of the ovaries when a bitch's reproductive life is finished. The ovaries are removed from the protective bursa and dissected from the surrounding fat. The ovarian tissue is thinly sliced to ensure even freezing, placed in a protective freezing solution and gradually frozen to -322 degrees F (-180 degrees C), the temperature of liquid nitrogen. They can be stored indefinitely in liquid nitrogen-containing vacuum tanks.

While the successful use of the ova from frozen ovaries is still theoretical, the future is bright ahead. It is a "rule of thumb" that



developments in veterinary medicine are 15 years behind that of human medicine. One can only hope that the procedures currently being developed for the use of frozen ovaries in women quickly find their way to veterinary medicine and canine reproduction.

Individuals wishing to consider freezing their bitch's ovaries for possible future use will need a DNA certificate, copy of registration papers, and a negative brucellosis test. The AKC has published their acceptance of individuals conceived from frozen ovaries when the feat is eventually accomplished.

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About the Author

Veterinarian Robert V. Hutchison is a 1972 graduate of The Ohio State University. His special interests include Canine Reproduction, Infertility, and Pediatric Care.

A founding member of Animal Clinic Northview, Inc., Dr Hutchison is a lifelong resident of North Ridgeville, Ohio. He is the Director of the Center for Canine and Feline Reproduction and Infertility, Inc., a canine and feline frozen semen center that he established in 1984.

Dr. Hutchison serves as a reproductive consultant for the Veterinary Information Network (VIN), a group of experts that consult other veterinarians from around the world with clinical concerns and problems. Internationally recognized for his lectures on canine reproduction and neonatology, he has also published numerous articles, authored textbook chapters, and produced informational DVDs on dog breeding, whelping, and neonatology. Dr Hutchison is an adjunct professor for clinical sciences at the colleges of Veterinary Medicine at The Ohio State University and Purdue University.