



Fresh Chilled Semen Breedings: Tips for Success Part 1: The Stud Dog

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In this podcast interview, Dr. Scarlette Gotwals discusses tips for success with fresh chilled semen breedings with a focus on the stud dog as part of CHF's Reproductive Health Series done in collaboration with Zoetis Animal Health. Dr Gotwals received her DVM from The Ohio State University in 1987. She has a special interest in canine reproduction and has been involved with canine reproduction and semen cryopreservation for 21 years. She is a nationally recognized authority in these areas and serves as a consultant to veterinarians through the Veterinarian Information Network. Dr Gotwals practices at Country Companion Animal Hospital in Morgantown Pennsylvania and is a consultant for the Canine Reproduction Division of Zoetis.

AKC Canine Health Foundation (CHF): What is a Fresh Chilled Semen Breeding?

Dr. Scarlette Gotwals (Gotwals): Fresh chilled semen breedings are an excellent way to accomplish breedings over a distance without shipping either the stud or bitch. It is much easier to ship the semen than transport the female. Fresh Chilled also is an option for international breedings. The highest success is achieved with proper preparation, selection of adequate candidates, accurate ovulation timing, and finding experienced veterinarians for the collections and inseminations.

CHF: How successful are fresh chilled semen breedings?

Gotwals: Fresh chilled semen breedings are expected to produce puppies 80% of the time. This means that 20% of the time even if everything goes as planned puppies may not result. Fresh chilled semen breedings are not for the faint at heart. Bitch owners are at the mercy of what they are shipped and receive. Weather and shipping delays can also, adversely affect the best laid plans.

CHF: How do you determine your dog or bitch are suitable for fresh chilled semen breeding?

Gotwals: Ideal candidates for fresh chilled semen breedings are studs and bitches free of any underlying health condition and in their reproductive prime 2-6 yrs. of age. They should have all their necessary health clearances. Fresh chilled semen breedings are not a treatment for



infertility. Bitches with a history of fertility issues are best bred to a highly fertile stud side by side with fresh semen.

Likewise the semen quality needed to optimize success for a fresh chilled semen breeding is higher than what is needed for a fresh semen breeding. Stud dogs with marginal semen quality may have very successful breeding careers with fresh semen but not be suited for fresh chilled. They may not chill well and achieve puppies with this breeding method. Selecting high quality breeding candidates maximizes your chance for success.

CHF: What makes a stud dog an acceptable candidate for a fresh chilled semen breeding?

Gotwals: Proper stud dog selection is critical to maximize success with the fresh chilled breeding method. Semen quality should start out with 75% or better forward progression motility, have less than 20% morphologic defects and have counts in the average range for the breed. Expected sperm counts can be estimated using 10 million sperm per pound of bodyweight. For example a 70 lb. Labrador would be expected to have a 700 million sperm count. Typical range 500-1.5 billion. So if your stud dog only had a 200-300 million sperm count he still might be able to be used for fresh chilled but may not be as successful.

The stud dog needs to be easily collected when needed. The stud also needs to have sufficient sexual rest prior to collections. Stud owners need to commit to collecting for fresh chilled on the days needed and not accept other bitches that need bred on the same days. It takes 60 days to produce a new sperm cell and another 2 weeks for maturation. The first two collections after a period of sexual rest are usually the best.

Stud dogs need to be proven by each breeding method performed. What is required for a successful natural breeding may not be sufficient for a fresh chilled semen breeding. Just because a breeder's stud dog doesn't miss with a natural does not mean the dog will be suitable for fresh chilled.

CHF: What helps to collect a stud dog?

Gotwals: Having an estrus teaser bitch present often makes or breaks a fresh chilled semen breeding. Stud dogs are easier to collect and may release 30-50% higher sperm counts when there is a bitch in standing heat present for the collection. Stud dogs also may cue on a breeding mat, stool or a specific collar only put on the dog for collections. In my clinic we have one room used for collections and all other veterinary work is performed in a different room. Males quickly learn if the door to exam room 3 they are being collected.



It is true many studs dogs can be collected without a teaser present but they typically won't release as many sperm cells. Using our Labrador example: if the male should have a 700 million count he might only release 210-350 million sperm without a suitable teaser present. What would you want shipped to you? Making the effort to find a suitable teaser increases the chances of a suitable collection for shipment.

CHF: How are males tested for fresh chilled?

Gotwals: Semen is collected for a complete semen analysis. After initial motility and morphology assessment the semen is prepared for fresh chilled shipment, extended with the chill buffer then kept in the refrigerator for 7 days to document how well and long the semen survives. A small amount is warmed and viewed under a microscope to assess motility daily. Good fresh chilled candidates have semen that starts out at 75% or better progressive motility and only drop off 10-15% in the first 24 hours. Many stud dogs have semen that will stay at sufficient motility levels for 5 days more. Buffers do not miraculously make semen better than it is but they do extend the life of the sperm cells in the cooled state.

CHF: How long can fresh chilled semen be kept to use for a breeding?

Gotwals: Fresh chilled semen is best inseminated in 24 to 48 hrs. The shorter the time interval from collection to insemination increases the odds that the semen will have the motility needed for pregnancy. It is true some stud dogs semen will last for 7-10 days but it is less than ideal to collect that far in advance. However this option is available for stud dogs with excellent semen quality that may be unavailable when needed. In these cases the semen is either held at the site of collection or shipped to destination and placed in an appropriate cooling unit to maintain the sperm at 4-5C or 40F until needed.

CHF: Can fresh chilled semen be shipped international?

Gotwals: Yes, is an excellent way to do an international breeding. Fresh chilled semen in an appropriate cooling box will survive 48-72hrs before needing the cooling brick replaced which is sufficient time to reach most countries. We recently shipped fresh chilled semen successfully to Bogota Columbia, Germany and England. Time in transit was 2-3 days.

CHF: What about first time males?

Gotwals: A stud dog needs to be proven with each breeding method. Inexperienced males need a test collection in advance. This is called a "Chill Check". A complete semen analysis is done and then the semen extended just like it would be for shipping. Then the semen is kept chilled. A small sample is tested for motility twice daily until the semen is no longer viable. For



overnight fresh chilled breedings it is best to have semen that is sufficiently motile for 48-72 hours. For international shipments semen that is motile for 5-10 days helps overcome any delays in shipping.

CHF: Can a breeder learn to collect semen and send fresh chilled semen?

Gotwals: Yes. Many breeders who stand dogs at stud learn how to do their own semen collections. This is permissible as long as they are only collecting their own dogs and not charging a fee. Breeders who do collect and ship on their own stud dogs should have a microscope, slide warmer and a centrifuge to properly process the semen for transport. We will post a link to this podcast page with a resource list for these products. Be sure to clearly label tube with collection date, dog name, and breed.

It is important to follow the instructions for the fresh chilled buffer used. Only the sperm rich fraction is extended with buffer. The sperm rich fraction is diluted 1:2-4 parts buffer: 1ml of semen would have 2 to 4 mls of buffer added.

CHF: How many shipments are needed?

Gotwals: One breeding during the optimum fertile period is often all that is needed. BUT if there are any factors that prevent the semen from arriving on the best day or if the stud doesn't not have high semen quality success can greatly be increased by shipping 2 separate collections. In my opinion shipping two collections increases success. Far too often unforeseen things happen—shipping delays, failure to have a teaser, weekend shipments, semen not fractionated on collection that lower the quality of the semen. Planning two shipments increase the chances of a successful outcome.

CHF: What can be done if semen on arrival is dead or poor quality?

Gotwals: Semen that is DOA (dead on arrival) typically froze during transport. This occurs most commonly from improper packaging. If the cool-it bricks are in contact with the semen tube there can be enough cold transfer to freeze the semen sample with in the first hour of packaging. Semen may be thawed on arrival but early freezing damaged the sperm cells.

In extremely cold weather you may only want to ship with a refrigerated brick if shipping point to point in extremely cold weather. If using a shipping container that uses 2 bricks one can be frozen and one closest to semen sample refrigerated. Also bricks should be frozen in a regular freezer over a refrigerator. Freezing bricks in a freezer set at a very low temperature can cause damage to semen in transit.



The other leading cause of poor quality semen on arrival is failure to separate out the sperm rich fraction at collection. Including excess prostatic fluid in the shipment decreases survival time of the sperm cells. Either learning to fractionate sperm rich fraction or centrifuging excess prostatic fluid greatly improves the motility of the semen on arrival.

CHF: How does the person collecting know when to centrifuge the semen sample?

Gotwals: The need for a centrifuge can be avoided by learning to fractionate the semen during collection to isolate the sperm rich fraction by itself. Practicing fractionating the semen every time you collect the dog for fresh AI's increases your proficiency when needed for a fresh chilled collection.

The sperm rich fraction is a small volume. For small breeds centrifuge if over 1 ml, for medium breeds if over 1.5 ml, large breeds over 2 ml, giant breeds if over 2.5-3 ml. A table top variable speed centrifuge is all that is needed. Stud dogs owners who collect and ship their own dogs can easily become proficient in learning how to concentrate sperm cells.

CHF: What questions should stud dog owners ask bitch owners when planning a fresh chilled semen breeding?

Gotwals:

1. How are the breeding days going to be determined?

The success for the stud dog is determined by the quality of the semen the stud owner ships and how well the bitch owner determines the day of insemination. Accurate ovulation timing is essential to optimize success. If a bitch owner is unwilling to invest in accurate ovulation timing then the stud owner has to decide if they are willing to go through all the effort to ship semen when it will be a shot in the dark.

2. Insemination method?

Stud owners need to be familiar with how best their stud dogs semen works with fresh chilled. For dogs with excellent semen this is not an issue but if stud dog has sub-standard semen, success can be increased by a TCI or surgical insemination. These options need to be discussed with the bitch owner before a commitment is made.



3. What are they anticipated days for insemination?

Be certain your availability before accepting a fresh chilled semen breeding. It is unfair to have a bitch owner go through all the expense of ovulation timing if you will be unavailable for the collection when needed or using the stud for another bitch on the same day's collection is needed.

4. Will this be a dual sire breeding?

Dual sire breedings are an option available to the bitch owner. The stud owner should consider if they are comfortable with this option. For the bitch owner having a backup dog in cases where the semen is not as good as expected on arrival can help them increase their chances of a pregnancy occurring. AKC requires both studs and dam have a DNA profile completed.

The resultant puppies will need to be DNA tested and matched to the correct sire before they can be registered.

Some bitch owners plan a dual sire from the beginning to try and have puppies from two different sires in one litter.

5. Are you willing to be forthright and honest with bitch owner?

Do not send poor semen samples. Call the bitch owner right away if the stud dog does not collect well or is found to have poorer semen quality than expected. If you did not collect with a teaser then find one and try repeating the collection.

If you are a breeder who collects and ships your own fresh chilled semen samples then you have an obligation to have a microscope at home to check motility on every sample shipped. Know your stud dog. If you are not skilled at fractionating out the sperm rich fraction you will also need a table top centrifuge to concentrate sperm cells prior to adding semen extender for shipment.

Summary:

Fresh chilled semen breedings are a viable method of achieving breedings without transporting the bitch. However there are many more variables encountered with this breeding method than a side by side or even a frozen semen breeding. Weather, stud dogs availability and health, availability of a suitable teaser bitch and willingness of stud owner to collect when necessary. I always tell my clients that these breedings are not for the faint at heart, be flexible and always have a back plan.