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## Proper Semen Handling

Gathering of my fall calving cow herd for final AI preparation will commence in the late afternoon of my composing of this news column. There is always hope and excitement in the prospect of making the next calf crop through use of proven sires or trying out that new bull you expect to do great things. Ask my family, I spend a great amount of time working through planned matings, trying to make each calf crop better and more consistent. Time and money are invested into synchronization and AI protocols, so making sure to follow proper semen handling techniques is a critical key to success.

Proper semen handling is crucial for the overall reproductive success of artificial insemination. Certain steps need to be followed to ensure the semen is stored, thawed, handled and placed correctly. Without proper storage and handling at all stages of this process, sperm cells can die rapidly and negate the likelihood of a pregnancy, costing the operation time and money in a multitude of ways.

Proper equipment needed for frozen semen handling includes: a nitrogen tank, AI gun (know if you have ½ or ¼ cc straws!), plastic sheaths that match the gun, OB shoulder-length gloves, straw cutter, water bath, thermometer, timer, tweezers, paper towels and non-spermicidal lubrication. Equipment can be stored in a purchased AI toolbox designed for that utility, but any toolbox can be made to work. One optional piece of equipment to consider is an AI gun warmer. Proven increases in conception rates when using a warmer, might make this a required tool. Keep equipment clean and in working order.

Liquid nitrogen is the medium that beef semen is frozen and stored in, at somewhere around the -320°F mark. It's important to store the tank in a clean, dry, well-ventilated, protected location. Do not store tanks directly on concrete, as it is corrosive to the tank. Liquid nitrogen evaporates, so check nitrogen level regularly using the provided measuring tool or yard stick. The tank size determines refilling timelines, but refilling should occur before the tank level reaches 4 cm of nitrogen. If evaporation isn't seen when pulling out the plug, the tank has gone dry and semen compromised.

Exposures to temperatures exceeding those of the frost line level at the neck of the tank (-103 to -116°F) will cause fluctuations in semen quality due to slight warming and spermatid death. Removing semen from the tank should be done quickly and efficiently. When semen is held above the frost line, a decrease in fertility can occur. If the straw isn't located and removed within 7-10 seconds of lifting the canister, the canister should be placed back into the liquid nitrogen for 10-15 seconds before attempting again. Tweezers or forceps should be used to avoid using fingers to grab at a straw of semen, as the heat of the fingers can cause the straw to begin to thaw and decrease the fertility of that semen.

Once the semen straw is located and secured, it needs to be placed immediately into a water bath containing 95-98°F water. Water bath thawing is the gold standard, but "pocket thawing" is another common practice utilized. While this method is practiced and some straws claimed to be designed for pocket thawing, this technique has been proven to be inferior to thawing in a water bath at the correct temperatures. The straw of semen should be placed in the water bath for a minimum of 30 seconds and no longer than 15 minutes. Only thaw the amount of straws that can successfully be inseminated within a 15-minute period, with time running from straw thaw to placement in the uterus.

After the thaw, dry the straw completely, confirm the correct bull is being used, cut the top of the straw opposite of the cotton plug, and finally load into an insemination sheath & gun. Once the gun is loaded, protect it from cold temps. This can be accomplished by placing the gun next to your body or utilizing a gun warmer to maintain a constant temperature. Rapid changes or contaminants can compromise the quality of the semen in a straw. This can be things such as excess heat or cold, direct sunlight, sweat, blood, water, urine and manure. Ensure correct insemination technique by depositing the semen past the cervix and before the bifurcation of the uterine horns.