

Proper Vaccine Storage in Cold Winter Weather

Very cold temperatures cause extra problems for cow calf producers as they strive to take the best care possible of the cows and the calves during extreme winter weather. In addition to the cold stress on the cattle, producers need to be aware of the need for proper storage of important biological products that will be required for the health of the herd. Normally the concern about vaccine storage in refrigerators is during summer and the need to keep them cool. Nonetheless, very low night time winter temperatures can have an adverse effect on vaccines that are stored in refrigerators that are located in unheated enclosures such as tack rooms in barns.

Each year cow calf producers spend thousands of dollars for vaccine products to immunize calves, replacement heifers, and adult cows and bulls. A vaccine can cost over \$3.00 a head, and if not stored properly that vaccine can be rendered ineffective. Producers cannot afford to overlook the importance of how they store vaccine and handle it prior to injection.



Most biological products should be stored under refrigeration at 35 to 45°F unless the nature of the product makes storing at a different temperature advisable (APHIS 2007). Read the insert or box label carefully to discover the recommended storage temperature. If vaccines are not stored within this temperature range, efficacy to the calf can and will be reduced. Killed vaccines are especially susceptible to freezing temperatures. Freezing a killed vaccine will alter the adjuvant or delivery system of a killed vaccine. This, in turn, negatively affects the

immune response to the antigen in the vaccine. Modified live viruses (MLV) are more stable but can be in-activated if they are repeatedly cycled above or below the required temperature range (Gunn et al, 2013). Also, once activated by mixing, MLV's effective life will be reduced to 1-2 hours and need to be maintained at the 35° to 45° F. This can be accomplished by only mixing the doses that you will use at that time and use a cooler to maintain temperature while working cattle.

Researchers from the University of Arkansas and Idaho went to farms and ranches in their states and analyzed the consistency of temperatures for different types, ages and locations of refrigerators over a 48-hour period. They found that only 26.7% and 34.0% of refrigerators were within the acceptable temperature limit 95% of the time, respectfully. Refrigerator location can also affect temperature. Refrigerators located in barns (35.6 °F) were colder than in mud rooms (41.72 °F) and kitchens (40.82 °F). (Troxel and Barham 2009). Temperature within a 24-hour period can also be highly variable for individual refrigerators. Troxel and Barham (2009) demonstrated some refrigerators may take up to 8 hours to cool down to the 45°F, while others will remain too cold varying from 24.8°F to 35.6°F.

Producers need to be aware of these variations in temperature so they are able to adjust refrigerator temperature as needed. Thermostats can also be very variable from unit to unit, so keeping a thermometer inside works well to monitor and to make adjustments as need. Simple indoor-outdoor thermometers work well to achieve this goal. The outdoor unit can be placed in the refrigerator while the LCD display can be hung with a magnet on the door. This allows temperature to be monitored without opening the door and many models will record the high and the low temperature in a 24-hour period so producers can adjust accordingly. Very inexpensive digital thermometers can be purchased and placed in the refrigerator that will allow the producer to check the refrigerator on those extremely cold nights or very hot days to make certain that the unit is within the desired range.