

Why the Temperature Matters

It is generally accepted that cattle vaccines should be stored at temperatures between 35° F and 46° F. But what happens if they aren't?

DROVERS NEWS SOURCE | March 24, 2025 02:32 PM



BT_COW_Vaccinate_tagging(Wyatt Bechtel)

Vaccines are an integral part of animal health management for ranchers and a cost of production so understanding best practices for storing them is important.

“Exposure to temperatures beyond the optimal range has the potential to negatively impact the effectiveness of both killed and modified-live vaccines,” says Dr. Catherine Dowling, a beef technical services veterinarian with Zoetis. “The extent of that impact will depend on a variety of factors — including the vaccine type, for how long and to what extreme the vaccine has been exposed.”

What happens when vaccines are exposed to freezing temps?

“Vaccine freezing presents some unique hazards, and killed vaccines are especially susceptible,” Dowling says. “In a best-case scenario, the vaccine, or the adjuvant within it, will simply be rendered ineffective. This means that the animal’s immune response to that vaccine will not be as robust as it could be if the product was handled properly prior to administration.”

More serious consequences may occur if the vaccine includes a Gram-negative bacterial component, often found in products used for scours and respiratory disease prevention. When these types of vaccines are exposed to freezing temperatures, it releases compounds within the bottle called endotoxins.

“Endotoxins are normally contained very well within the bacterial cell walls, but they can burst as a result of freezing temperatures, leaving us with a situation called free endotoxins,” Dowling explains. “Vaccines containing free endotoxins may cause animals to experience a severe, life-threatening reaction after vaccination, with symptoms closely resembling anaphylaxis.”

What happens to vaccines exposed to temperatures above 46° F?

Just like with freezing, exposure to temperatures above the labeled range can reduce vaccine potency and effectiveness. That’s why it’s important to keep vaccines cool and out of direct sunlight as much as possible. For modified-live vaccines specifically, this likely means mixing only one bottle at a time and using the product within an hour of mixing, as heat and sunlight quickly work to degrade the vaccine after it’s mixed.

Is your farm refrigerator a culprit? It’s easy to think about chuteside scenarios in which a product may be exposed to temperatures outside the ideal range, but it’s also important to consider where vaccines are typically stored — your on-farm refrigerator. You may be surprised at the variability in temperatures within your refrigerator.

In fact, a University of Arkansas case study comparing 191 on-farm refrigerators found that only 26.7% of refrigerators kept the temperature within the acceptable range.

Dowling recommends keeping a thermometer near the vaccines in the refrigerator and recording the temperature at different times throughout the day to ensure vaccines are stored according to label directions. Avoid storing vaccines in the door or at the back of the refrigerator to limit the risk of temperature variability or freezing.

Always refer to the product label for product storage and administration specifics and contact your local veterinarian with any questions.