

Calving Ease

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Refrigerator or Storage Cabinet?

Summary:

1. **Monitor internal temperature.**
2. **Avoid shock loading or prechill liquids to reduce impact.**
3. **Consider a separate refrigerator just for high-value products.**

How well is your refrigerator meeting your needs for low-temperature storage? It should be more than just a clean place to keep medications, vaccines and perhaps colostrum. Here are a few key points to remember.

Monitor temperature

How sophisticated you get for monitoring may depend on the value of products stored in the refrigerator(s). Remember that in addition to nearly all vaccines some medications do require storage between 35 and 45 degrees. And, as much damage can be done to products like these by freezing as by allowing temperatures to rise above 45 degrees.

I checked both Wal-Mart and Kmart for refrigerator thermometers. They vary from \$2.99 to \$5.99 not including taxes. I suggest suspending the thermometer from a shelf where it easiest to read when adding or removing contents.

Add up the value of medications and vaccines stored in your refrigerator. Does the total come anywhere close to \$500? If yes, consider a temperature alarm system. They monitor internal temperature, show that temperature on an external display and make an alarm sound when either the high or low threshold is exceeded. The least expensive I found was \$12. Others ran up to \$35 and \$55 (not including taxes). All of them are battery powered so they will work during power outages, too.

Remember that temperatures in refrigerator doors can be significantly lower than in the "core" of the unit. Thus, place temperature-sensitive animal health products, especially vaccines, on the shelves rather than keeping them "handy" in the door. If you have self defrosting appliances remember that they have roughly a 10 degree "defrost-cycle" spike in temperature that adds to the risk of storing vaccines in the door.

Avoid "shock loading"

Shock loading means adding a large enough heat source to raise the refrigerator internal temperature above 45 degrees and keep it there for an extended period of time. An example would be adding three or more gallons of warm colostrum.

We found in our colostrum cooling research that as little as three gallons of warm colostrum in two-quart nursing bottles would bring internal refrigerator temperatures up over 50 degrees. With eight to ten bottles it took only 15 and 5 minutes respectively to reach this 50 degree threshold. Ten bottles of 90 degree colostrum sustained temperature above 45 degrees [that's the upper level for storing vaccines] for 250 minutes!

We measured diluent temperatures in vaccines stored in this same refrigerator. When shock loaded with either eight or ten two-quart nursing bottles filled with 90 degree colostrum the vaccine diluent temperatures went above 45 degrees – actually over 50 degrees with ten bottles. This “warm” condition remained for nearly three hours – and would be repeated every time a fresh batch of colostrum was added!

Pre-chill liquids

We tried pre-chilling to 60 degrees. The effect of pre-chilling is mostly to shorten the time that refrigerator internal temperature remains above 45 degrees compared to 90 degree colostrum. The advantage of pre-chilling is greater as the volume of liquid increases – if the farm regularly has three or more gallons of colostrum to store seriously consider pre-chilling.

Many farms chill their colostrum before loading it into either refrigerators or freezers. They do this using either an ice bath for colostrum containers or dropping ice containers into bulk colostrum buckets. This is mostly for inhibiting bacteria growth. The side-effect is reducing shock loading.

Store high value products in their own refrigerator

If temperature-sensitive animal health products are stored on-farm it may make sense to purchase a separate compact unit for them. This especially true when the value of the products exceeds the price of the refrigerator. Typical costs run between \$100 and \$300.

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