Calving Ease

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Colostrum Chilling

In the first place, if we are going to feed colostrum within thirty minutes after it is collected, why would we want to chill it? Obviously, the answer is that it does not need chilling. Just feed it promptly.

Why chilling?

We want to feed clean colostrum. Our goal is to reduce the bacterial load in colostrum in order to promote good gut health**.** Clearly it makes sense to avoid bacterial inoculation of colostrum as a first step toward this goal. That means clean teats in the parlor. In addition, we need to start with clean collection, feeding and storage equipment.

In many cases not all our colostrum is going to be fed directly from the dam**.** If it is going to be held more than one-half hour the colostrum is at risk of growing bacteria. Colostrum is very good bacterial growth medium – favorable pH and lots of readily available nutrients. Also, when collected from a cow it is at an excellent temperature to encourage bacterial growth. By the way, we describe these growth rates using the term "Generation Time."

One way to slow down the rate at which bacteria multiply is to lower the temperature of the growth medium – colostrum. For example, when we reduce colostrum temperature from 95 to 60 degrees, coliform generation times increase from roughly 20 to 150 minutes. Thus, if we want to cut down bacteria numbers that come from initial inoculation one alternative is to rapid chill the colostrum to at least 60 degrees.

Farm-friendly ways to Chill

In order to be "farm-friendly" a chilling method has to be simple and cost effective. One such method is a water bath. Colostrum is transferred into containers smaller than milker pails or five-gallon pails. Most folks use calf nursing bottles. Others buy two or four quart plastic containers. Unless the containers are one-use disposable ones make sure that it is easy to brush all the inside surfaces.

Right-size the tub for the water bath based on your experience with colostrum volume. Larger farms may consider using several water bath containers for increased flexibility. Remember that for most efficient heat transfer at least ¾ of the container needs to be submersed in the ice-cold water. And, just packing ice around the containers without water is not an efficient method of chilling.

Very large operations should consider purchasing a used restaurant ice maker. Smaller dairies find it practical to use the freezer compartments of refrigerators or a small chest freezer for making ice. Several of my clients repeatedly freeze “cold-packs” rather than use water for making ice.

Another “farm-friendly” method is adding containers of ice directly to the warm colostrum. An ice:colostrum ratio that works well to chill just-collected colostrum to 60 degrees within one-half hour is 1 quart of ice to 1 gallon of colostrum. In general multiple small ice containers will do a better job of chilling compared to one larger container. For example, six 16 ounce recycled plastic soft drink bottles compared to one one-gallon plastic jug.

A few dairies place the equivalent of 3 quarts of ice in the stainless steel milker bucket before milking the fresh cow. This procedure eliminates errors in remembering to add ice once the fresh cow is milked. Other dairies with more than a few quarts of colostrum to chill pour 3 gallons of colostrum into a five-gallon pail, add a one-gallon jug of ice, put a lid on the pail and put the entire pail-jug-colostrum into a refrigerator. The colostrum chills from the inside-out as well as from the outside-in.

One caution! When containers are placed directly into colostrum they need to have as few bacteria on their surfaces as is practical. Just rinsing them quickly with tap water as they are transferred from the freezer into the colostrum is a best management practice. If these containers are used more than once someone needs to be given the responsibility of cleaning these each time they are cycled through the freezer. Remember to avoid colostrum build-up underneath the caps on these bottles and jugs.

- Many dairies have one person responsible for handling colostrum. In order to both rapidly chill colostrum and keep it cold until that person is available some farms extend chilling. That is, after placing ice containers directly into colostrum for initial chilling the night shift workers simply replace the first batch of ice bottles with a fresh set as they leave. Or, additional ice is added to the ice bath to carry the colostrum over until the colostrum person is available. If an ice bath container is right-sized to fit into a refrigerator that solves the cooling problem. Another dairy immediately after harvesting colostrum places a one-gallon jug of ice in each milker bucket and they go into a chest freezer to wait for processing. – are they working?

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