

# Colostrum: How to Manage Shelf Life

Shelf life is the length of time that a perishable item is given before it is considered unsuitable for use. In the case of maternal colostrum we use bacterial contamination to measure its suitability. The criteria for colostrum for newborn calves using laboratory incubation methods are in colony forming units per milliliter (cfu/ml):

1. A total plate count of less than 50,000 cfu/ml all bacteria
2. A coliform count of less than 5,000 cfu/ml

## **LEAST EFFECTIVE METHOD**

Storing colostrum at parlour or dairy temperature has shelf life of less than four hours. If you sit a bucket of colostrum in the dairy at 21° coliform bacteria will double every hour. Other bacteria species will grow, too, but at a slower rate. It is common at 12 hours to find bacteria counts of over one million (cfu/ml) in colostrum stored this way if parlor and equipment hygiene are compromised. In the name of good calf health, if you cannot feed the colostrum within one-half hour after collection, dump it.

## **OKAY TO FEED FOR TWO DAYS**

If a bacterial growth inhibitor or preservative is added at the time colostrum is collected then the generation time [length of time needed to double the population] is 10 times longer. If you start with reasonably clean colostrum and add potassium sorbate liquid preservative, then at dairy temperature the colostrum may be under 100,000 cfu/ml about two days later. However, if as harvested the colostrum is already at 10,000 cfu/ml your colostrum is not likely to be suitable for feeding. [More on potassium sorbate use go to [www.calffacts.com](http://www.calffacts.com), click on Metric version, scroll down to “Potassium Sorbate: Use Protocol.”]

Or, if you chill your colostrum to 16°C within 30 minutes from collection and keep it in a refrigerator at 4°C the bacteria count may be acceptably low for up to two days. To be on the safe side, it is a best management practice to regularly sample colostrum handled like this. Have it tested for bacteria in a laboratory.

## **OKAY TO FEED UP TO SIX TO SEVEN DAYS**

Chilling colostrum rapidly immediately after it is harvested is one key to extended shelf life. The standard is down to 16°C within 30 minutes. At this temperature the generation time is extended out to 150 minutes. If you start with good cow preparation in the parlor and clean, disinfected buckets, this can mean a really low bacteria count initially.

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Then, add a preservative at collection time. One preservative with which we have considerable experience is potassium sorbate. A 50% solution added at the rate of 20 ml/2 litres and mixed in thoroughly extends the generation time 10 times. At 16°C this means extending the time for coliform bacteria to double from 150 to 1500 minutes. Go to [www.atticacows.com](http://www.atticacows.com) click Metric version and scroll down to “Potassium Sorbate: Use Protocol for Colostrum.” Other preservatives probably will work to achieve acceptably low bacteria counts; I just do not have data in hand in order to describe their use.

The routine here is: clean teats, clean collection bucket, add preservative immediately, chill to 16°C within 30 minutes, store in refrigerator at 4C or below.

### **OKAY TO FEED UP TO EIGHT TO TEN DAYS**

If you plan to push the shelf life of colostrum out to eight to 10 days accept that you will have to heat treat it. Heat treating, often incorrectly referred to as “pasteurizing,” drastically reduces the pathogens in colostrum. Guidelines for heat treating colostrum are posted at [www.calfacts.com](http://www.calfacts.com). Click on Metric version and scroll down to “Colostrum: Heat Treating Guidelines.”

The keys to making heat treating colostrum work are:

- Start with clean colostrum
- Keep the heat-treating unit clean and in good operating condition
- 60 minutes at 60°C with constant agitation
- Chill rapidly to 16°C
- Store in clean disinfected containers
- Store at 4° or less

### **OKAY TO FEED AT LEAST EIGHT TO TEN DAYS**

Start with heat-treated colostrum that is processed according to the keys listed above. Then, add the preservative as the colostrum comes out of the heat-treating unit mixing it in thoroughly. These bacteria counts can be as low as 100 cfu/ml even at the end of a week.

### **SERIOUS, BIG TIME SHELF LIFE – FREEZE IT!**

The keys to effectively freeze colostrum and have a low bacteria count when thawed and fed are:

- Start with clean colostrum
- Store in clean, disinfected containers
- Chill to 16C within half an hour – chill before going into the freezer!
- Store at -18°C or below for up to one year

Thanks to Dr. Sandra Godden, “Colostrum Management for Dairy Calves,” presentation at Cornell Summer Dairy Institute, July 3, 2007 for the background information on colostrum bacteria counts under selected storage conditions. Click [HERE](#) for a Hoard’s Dairyman note on the importance of low bacteria counts in colostrum.

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