# Calving Ease

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## Wash Water Always Above 120°F

- **Removing milk residues from milk handling and feeding equipment requires special chemicals, water temperatures and skills.**
- **Ideal water temperatures differ depending on phase of cleaning.**
- **Keeping milk handling and calf feeding equipment clean can be as much an attitude as it is having the proper protocols.**

**Why can't we approach washing milk equipment like "doing the dishes?"**

When we wash eggs or mashed potatoes off our plates at home it seems pretty simple. Warm water, a few drops of dishwashing detergent and a little bit of "elbow grease" seem to do the job very adequately.

But, getting milk equipment really clean is a different task. Recall that milk contains a variety of proteins, an extensive profile of fats, milk sugar, minerals and lots of minor components. When we rinse this equipment immediately after using it we might flush 90 percent of all of these milk residues right down the drain. When solids are partially dried we rinse away a much lower percentage of residues.

During the washing phase of cleaning milk handling and feeding equipment our task is to deal with these residues – these stuck-on bits of protein and milk fat that did not rinse away. They are our challenge.

**Don't set yourself up for failure! Rinse before washing.**

Recall that milk is mostly water – only about 12 to 14 percent solids. All the rest is water. Our best opportunity to get rid of milk solids is to flush them away while they are still suspended in water.

The most common errors made in rinsing milk handling and feeding equipment before washing are (1) allowing milk solids to dry on to the equipment before rinsing and (2) rinsing with excessively hot water.

Scheduling rinsing activity before milk dries on sometimes is a choice that we can make. Timely rinsing does make manual washing of equipment easier because less brushing is required to remove stuck on protein and fat.

Water temperature for rinsing? Warm only. When the water is too cold the butterfat congeals and sticks to equipment surfaces. Water above 100°F (38°C) will keep butterfat liquid. When water is too hot the milk proteins "cook." They bond to equipment surfaces. Water below 120° F will not denature proteins and create protein films. No thermometer? Rinse water should feel just warm when run over your bare hand.

**Wash water must be hot. Never below 120°F.**

Remember we use a chlorinated alkaline detergent solution to wash equipment. The low pH is essential for breaking the milk fat into tiny droplets. That way the fat will be suspended in the detergent solution. The chlorine increases the solubility of proteins. This helps insure that protein films end up in the wash water.

Wash water must remain above 120 degrees if all these solids are going to be flushed away. Below this threshold the solids either in solution or in suspension start to be re-deposited on equipment surfaces.

**Yes! That is correct. These solids can re-deposit on contact surfaces.**

Imagine washing nursing bottles, tube feeders, and pails in a double sink in your calf kitchen. As you scrub each item the milk fats and proteins go into suspension or in solution in your wash water. If about half way through your wash-up routine the wash solution falls below 120° these milk solids start to re-deposit on contact surfaces.

Imagine, you brush and brush. You move these residues into the not-hot-enough wash water. At the same time these same residues are sticking to whatever you are washing. The classic Sisyphean situation – an endless task. A game you can never win. Items washed close to the end of your wash-up routine may come out of your wash water dirtier than they were before they went in.

**Bottom line?** Regularly check the temperature of your wash water at the end of your wash-up routine. Always at least 120°, at the end. If not, change something. Click HERE for tips for keeping wash water hot enough during cold weather.

References: Monken, Alan and Winston Ingalls, "Milking System Cleaning and Sanitizing: Troubleshooting Milk Bacteria Counts" NMC Regional Meeting Proceedings (2002); Progressive Dairyman "How to properly clean milking equipment" 27 Dec 2011; Edmondson, Peter, ""Cleaning the milking machine" accessed at http://www.milkproduction.com/Library/Scientific-articles/Milk--milking/Cleaning-the-milking-machine/ on Dec. 17, 2013.; Sigurdson, C.G. and B.R. Cords, D. Fredell, "Practical Hygiene and Disinfection on Dairy Farms," accessed at http://www.cvm.umn.edu/dairy/prod/groups/cvm/@pub/@cvm/documents/asset/cvm_33550.pdf on Dec. 17, 2013; Bava, L and Others, "Effect of cleaning procedures and hygienic condition of milking equipment on bacteria count of bulk tank milk: J. Dairy Research 2011 Mar 4:1-9;

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