

## Disinfecting Calf Equipment and Housing

### Rule Number 1. Clean, clean, clean.

Disinfectants only work efficiently on clean surfaces. In very plain terms, it is a waste of time, effort and money trying to disinfect dirt!

These bottles have thick biofilms both inside and out. Rinsing and/or soaking in any disinfectant will be ineffective.



Stainless steel or plastic milking equipment can have biofilm buildup as well. This is often seen as a dark residue on surfaces – usually these will feel like rough surfaces. When they get thick enough they are visible. Disinfectants will not effectively kill bacteria when these are present.



Dumping this calf pail and rinsing it with a disinfectant will not effectively reduce bacteria exposure. You cannot disinfect dirt!



### **Cleaning strategies for feeding equipment**

When done well, washing removes nearly all organic matter and biofilms that reduce the effectiveness of disinfectants. Plus, most of the pathogens will go down the drain with the rinse and wash water. Follow these steps before using a disinfectant:

- **RINSE** - using lukewarm water rinse the equipment to remove manure, urine, dirt, milk, colostrum.

- WASH – for water and grain pails brush in a warm chlorinated detergent solution. For colostrum and milk equipment brush in a hot (above 120°F) chlorinated detergent solution.

## **Cleaning strategies for calf housing**

“Dry” cleaning often involves tearing down pens or moving hutches. Get rid of the accumulated manure. Scrape down to the concrete base. Or, for hutches or pens on a stone or sand base remove a small amount of the base along with the manure. Physically scrape off chunks of manure from pens and gates. Remember that all waterers need to be included in this step as well.

“Wet” cleaning we usually call washing or sanitizing. When done well this step can get rid of nearly 99 percent of our pathogen load. Soaking with water, scrubbing, brushing, scraping all work well in getting rid of all kinds of organic matter.

Using a pressure washer can save a lot of hard scrubbing. Remember not to use this equipment in buildings occupied by calves and heifers. The high-pressure water aerosolizes the manure solids. These solids can contain pathogens. They remain in the air long enough for animals to breath them in and potentially become infected. If you have a choice of high-pressure washers, choose one that heats the water above 160°. This hot water not only washes pathogens away but also kills many of them.

Always let housing equipment and pens dry before applying the disinfectant. Wet surfaces dilute the disinfectant and lower its effectiveness.

## **Rule Number 2. Choosing an efficient disinfectant**

Look down this list of potential bacteria, parasites and viruses. Note that the ones at the top of the list are most susceptible to disinfectants. Ones at the bottom of the list are most resistant.

- Mycoplasma
- Gram-positive bacteria (Staph. and Strep.)

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- Gram-negative bacteria (E. coli, pneumonia-causing bacteria like Pasteurella)
- Enveloped viruses (Coronavirus)
- Non-enveloped virus (Rotavirus)
- Fungal spores
- Foot and mouth disease virus
- Bacterial spores (Clostridial bacteria)
- Coccidia
- Prions (BSE)

Generally to reduce pathogen exposure and improve calf health:

- In nearly all calf housing we can confidently predict the presence of at least E. coli and Pasteurella bacteria and coccidia. These pathogens suggest the use of a disinfectant with a general purpose or broad-spectrum label claim
- For feeding equipment following best management practices that include a chlorinated detergent and/or chlorine rinse may adequately reduce exposure to scours-causing pathogens.

Where significant numbers of calves are involved in a disease outbreak it is best to work with the herd veterinarian to evaluate the best alternatives for disinfecting. A comprehensive summary of the antimicrobial spectrum of disinfectants may be found at

<http://www.cfsph.iastate.edu/Disinfection/index.php>. The same resource has a summary table of the characteristics of selected disinfectants (advantages, disadvantages, effectiveness against selected pathogens). Remember when choosing based on cost read carefully the mixing instructions and coverage. For housing make your comparison based on square foot of coverage, not per ounce of concentrated disinfectant. For feeding equipment that can be soaked make the comparison based on a given volume of solution.

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## **Rule Number 3. Mix and Apply following the manufacturer's directions.**

1. Mix correctly. Some products will have different dilution rates depending on what you expect to accomplish. Most important, do not over-dilute. Overly diluted disinfectants may be ineffective making a waste of both your time and money. Check the product label for limitations due to water hardness and pH.
2. Application to housing may call for “soaking.” That means applying enough product until you begin to see liquid running down the equipment or pen. With feeding equipment “soaking” means complete immersion in the disinfectant solution. Do not expect to “soak” away pathogens on feeding equipment that is not clean. Biofilms too thin to see may increase resistance to certain disinfectants as much as 1000 times compared to clean surfaces. For example, soaking either a nursing bottle or colostrum collection milker bucket with a strong bleach solution for 24 hours may be ineffective in killing bacteria. Why? Because biofilms of protein and milk sugars buffer the disinfectants. Clean – then disinfect.
3. Contact time is usually specified on the product label. Recommended contact time will vary from product to product. Also, expect contact times to vary depending on the microorganism. When soaking housing equipment and pens remember contact time means how long the surfaces remain wet. When soaking feeding equipment contact times means how long the pieces were immersed in the solution.
4. Precautionary Statements – follow them. **Be sure that safety comes first.**

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