

CALVING EASE

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Applied Immunology: Keeping Animals Healthy

This is the title of a paper by Dr. Don Sockett from the University of Wisconsin. Among several topics in the paper he describes physical barriers that provide protection against infection. Here is his list:

- Intact skin and mucous membranes
- Normal microbial flora
- Fatty acids in the skin
- Acid in the stomach
- Hair and cilia in the nasal and respiratory tract
- Enzymes in saliva, tears and intestine
- Coughing, sneezing, vomiting, urination, diarrhea

He comments, "The items listed above are designed to prevent the entrance of microorganisms into the body or if they are introduced they can be rapidly destroyed (acids, enzymes) or eliminated from the body." (NRAES 75, p42)

Promoting strong barriers

What are the things we can do to promote strong physical barriers to infection? First, provide calving areas and calf housing that present few hazards for physical injury. That is, we want to keep the calf's skin intact. Eliminating sharp pipes, broken gates and sharp ends on calf pens all help prevent scratching and cutting skin.

Remember, too, that we do not want to scratch the inside of mouths and throats. Check your esophageal tube feeder. Is the ball and tube free of rough points that could cause injury? Also, be certain that everyone using a tube feeder understands the need to lubricate the tube and to be gentle when inserting and removing the tube.

The normal numbers of microbial flora in the gut will be reduced when we treat calves with antibiotics. Over a long enough time after we finish treatment this population will recover to its normal level. In the short run we may wish to introduce a source of the most common normal microbial flora to speed up this recovery. There are a number of "probiotic" products on the market. Look for ones that contain lactic acid bacteria.

All of these products contain live cultures. The shelf life is very sensitive to storage temperature. Unless the product is refrigerated I recommend that you purchase containers that will be used up within a month. That way even if the product is stored at room temperature (around 70F) the chances of favorable bacteria survival are good. Remember heat is your enemy – store probiotics in a place that is 70 degrees or lower.

Acidity or low pH in the abomasum is one of Dr. Sockett's barriers. How do you imagine we influence the acid level (pH) in the abomasum? Every time we feed milk or milk replacer to a calf the pH in her abomasum goes up. The acid level goes back to normal within a few hours. This is good because acidic conditions are hostile to pathogenic bacteria.

Research using up to five feedings daily did show a decrease in the cumulative time the abomasum had undesirable pH levels. However, the difference between many feedings and twice daily feedings was judged not to be an issue for calf health. One time a day feeding for calves with diarrhea should be discussed with your veterinarian. Extended use of electrolytes containing bicarbonates increases the time that the abomasum is at an unfavorable pH level as well.

We cannot see cilia in a calf's windpipe (trachea). Even though they are small they have a big job. When working properly they do a good job reducing the number of pathogens that get down into the respiratory tract. Normally, each cilium waves back and forth to push foreign objects up and out. In addition, there is "wave-like" movement that further ejects pathogens. As ammonia gas levels increase in a calf's environment these protective mechanisms do not work well. This is less of a problem with calves raised in hutches compared to those raised in barns.

We can attack ammonia gas problems two ways. One is to slow down the production of gas. Clean bedding reduces the mixing of urine and feces that promotes gas production. Even if they do mix, when urine and feces are in dry bedding (less than thirty-five percent moisture) ammonia gas is reduced. Keeping enough bedding in pens so that you do not get wet knees when kneeling in the pens is a practical way to assess adequate dryness.

The other way to attack ammonia gas problems is providing adequate air exchange in the barn. In northern climates this most often is an issue during the coldest winter months. The temptation in cold weather is to close up barns. Elevated ammonia gas levels often result. See www.atticacows.com in the Calf Facts section the table "Ventilation Air Exchange Rates" developed by Curt Gooch, Cornell Pro-Dairy for recommended volumes for selected size animals for different seasons.

Reference" NRAES "Dairy Calves and Heifers: Integrating Biology and Management" conference proceedings, January 25-27, 2005. NRAES-175.

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