

CALVING EASE

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Immunity

We all take it for granted that we are immune to most of the diseases that surround us. Ah, but how about the common cold? Well, we catch a cold; build immunity to the virus; then get over it. Three to five days of discomfort. On the other hand, we are aware of serious harm resulting from diseases we can develop immunity to from a vaccination. Think of smallpox, polio, whooping cough, tetanus, rabies to name a few. So, we choose to be vaccinated against certain risks.

Calves need to be cared for with the same kind of risk management. Which pathogens threaten the health of our calves? How great is this threat on our farm? These questions are best answered with a knowledge of our farm's health history. Differences of opinion often occur in deciding how great a risk we face in reducing illness among calves. Where the exposure is almost certain and at a high level unprotected calves usually die in droves. For example, the most common bacteria on our farms are *E. coli*. Found in all the bovine manure, these bacteria seem to be everywhere in great numbers. We know manure is here to stay. We vaccinate our dry cows to stimulate extra high levels of *E. coli* antibodies in their colostrum. Then we chuck lots of colostrum in newborns as early after birth as practical. Called passive immunity - it came from mama.

What about immunity to pathogens that the calf develops on her own? We know that by the time she is six months old she will have naturally developed immunity to a wide range of bacteria and viruses. But, what risks do we face in just waiting until immunity is developed "naturally?" Think back to the human examples above. How willing would you be to develop natural immunity to polio, small pox or rabies? If our farm has a history of certain respiratory illnesses that either kill or stunt calves, we may want to think seriously of developing immunity to them by vaccination rather than full-blown illness. Remember, being immune to a bacteria or virus usually means that you or a calf has reduced risk of having the disease. Neither naturally nor artificially acquired immunity will reduce the risk of illness to zero (well, there are some exceptions but this is true often enough so we need to think of vaccination as risk reduction rather than one hundred percent prevention).

If we decide to vaccinate calves against a given pathogen we must remember that this vaccination is just one part of preventing sick calves. Some calves don't have enough of the right food. Some calves get stressed by weather. These conditions suppress the calf's immune system. She can't handle even the usual pathogen exposure - get's sick or dies. Even the effect of the vaccination depends in part on the calf's health. The ingredients of vaccines are called antigens. The calf's first response to injected antigens is to increase her demand for energy. Then she starts using amino acids and other nutrients to make the immune system cells and molecules stimulated by the antigens we injected. Calves that are already borderline on their energy and protein intake just can't respond to vaccinations as well as calves with adequate nutrition. To put this another way, vaccination won't do calves much good if they are not already healthy and growing well.

Now the even harder question of when to vaccinate calves. If we wait until the immune system is mostly mature, we wouldn't vaccinate until puberty. What if the farm's health history shows the need to control one or more diseases before puberty? Dr. Perino (Nebraska) says that immune system development starts in the first trimester of pregnancy. Dr. Cortese (Pfizer) describes the newborn calf's immune system as functional but immature. We already know this - that's why we pour lots of high quality colostrum into newborns. But what about vaccinating? Wait until when? Depends. What's the pathogen and disease? When does it normally make calves sick or kill them? How long can we wait? The general rule that nearly everyone seems to support is later is better if the risk is later. What if the risk is "sooner?" What about a high rate of respiratory illness in four month old calves? Can't wait until six months to vaccinate if they are getting sick at four months. What if they are getting sick at twenty-one days? Can't wait until two months.

Dr. Cortese (Pfizer) says that recent research shows that there is a short period from 7 to 15 days of age when calves will respond to IM vaccination. Responses will be greater among calves that are colostrum deprived than those that have high levels of passive transfer from colostrum. If the first vaccinations are delayed past two and a half weeks, producers should wait at least until five weeks of age with IM vaccinations says Dr Cortese.

Stress and immune response. These go together. They work in opposite directions. Calves that are stressed out have poorer responses to vaccinations than do calves with lower stress levels. When possible vaccinate within a normal daily routine - usual housing, usual feed, usual people taking care of calves. Less desirable is loading on and off a trailer, changing housing, changing feed and then vaccinating at once. It's not that the vaccination won't give any response. It's just that we get a lot less immunity for the \$\$\$ and the calves remain at higher risk than we intended.

CALF FEEDERS' TIP

In order to stick to any kind of a vaccination schedule for calves some of us have to vaccinate in all kinds of weather. In hot weather consider this. Heat stresses calves. It

raises their body core temperature. On a day that reaches its peak temperature at 2:00 PM, however, research shows that bovines usually peak their body core temperature two to four hours later (4:00 to 6:00 PM). If we want to vaccinate at the lowest stress time of day, that is very early morning, not early evening.

Reference: Geni Wren, "Immunology of the Calf," in Bovine Veterinarian, February, 1996.

If you know of someone that doesn't currently receive Calving Ease but would like to, tell them to WRITE to Calving Ease, 11047 River Road, Pavilion, NY 14525 or to CALL either 585-591-2660 (Attica Vet Assoc. office) or 585-343-8128 (Offhaus Farms Office) or FAX (585-591-2898) or e-mail sleadley@frontiernet.net or pams91@2ki.net. A limited number of back issues may be accessed on the Internet at www.calfnotes.com and clicking on the link, Calving Ease.