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Calf Note #174 – Putting out the fires

I recently received an e-mail from a veterinarian in an Asian country who just started working with a large commercial dairy. On this farm at the time of the e-mail, there were to be more than 500 calves born in the next three months, most of which were heifers (the farm uses sexed semen).

The situation on the farm is dire – the vet suggested that “most” of the calves die within a month or so after birth. Now, I don’t know what “most” means, but assume that it’s (1) more than half and (2) much too high. There are major problems, likely with a combination of feeding, management and pathogen issues. And, while it’s difficult / impossible to make specific recommendations on how to intervene on this specific farm without actually being there, I tried to make some general management recommendations that might help the vet take steps to stem the tide of mortality – i.e., helping him put out the fires. I thought it might be helpful to share those comments in the Calf Note.

There are hundreds of specifics that I could recommend; however, I felt it important to boil my recommendations down to five specific, achievable steps that would be helpful in improving calf health and reducing calf mortality. Here are my five recommendations... all of them are based on two underlying and fundamental concepts. Firstly, disease is caused by exposure to a pathogen to which the calf is exposed, usually by something we do; and secondly, that the calf’s immune system must be strong enough to fight off the potential pathogens in the environment. Of course, environment, nutrition, housing and other aspects of management can interact with either exposure or immunity or both. Here are my five recommendations.

1. Colostrum. A key to immunity of neonates is feeding enough high quality colostrum early in the calf’s life. An important step in improving the health conditions of the calves is to make sure they are fed at least 150 grams of IgG in the first 24 hours of life. How can you tell how many grams of IgG to feed the calf? There are two basic steps. Use a BRIX refractometer to measure total colostrum solids. If the total solids is $\geq 21\%$, the IgG content of the colostrum is at least 50 g/L. For the first feeding, use colostrum that is ≥ 21 and feed at least 3 liters (4 is better). The colostrum fed must be clean and not contaminated. Protocols for collecting, storing and feeding colostrum should be reviewed with everyone involved. If the farm is leaving the calf to nurse the dam, that practice should stop immediately. Finally, periodic blood samples should be taken to measure serum total protein, which should be greater than 5.2 g/dl in at least 75% of the calves. These steps will go a long way in providing the calves with sufficient immunity to deal with levels of exposure on well managed farms. However, passive immunity is no guarantee of calf health; high levels of exposure or exposure to a pathogen to which there is no passive immunity puts the calf at great risk. Thus, it’s also essential to reduce exposure.

2. Exposure (or where's the bug coming from?). If a large portion of calves are becoming sick, they're being exposed to one or more pathogens that result in disease. We need to figure out the source of the bug(s) and eliminate them. Here, we're playing detective – first, we need to track down the source of the bug. Fecal cultures and necropsies conducted by the consulting veterinarian are very helpful to identify which bugs you're looking to stop. This is important, because intervention strategies vary by class of pathogens – you deal with a bacterial infection differently from a coccidial infection, for example. Most calf death loss prior to weaning is caused by gastrointestinal pathogens, but respiratory infections may be important, also. Here's where your vet's experience and training will be invaluable. Once you know which pathogen(s) you're fighting, you can target your interventions appropriately.

The next step is to look at common equipment, but especially feeding equipment, since it's common to all calves on a large operation. Mixers, pasteurizers and any other equipment used to mix or distribute liquid feed should be torn down, cleaned and disinfected. Bottles, buckets, nipples, water and feed buckets all should be cleaned similarly. If there are not specific, written protocols in place, now's the appropriate time to write and implement them. Make sure things are done properly – you can't simply assume that what might be written into a protocol is being done. It's the managers' responsibility to make sure the work being done is appropriate and it's being done appropriately.

What about the feeds? Most commercial feedstuffs (milk replacer, starter) are generally produced in well designed, sanitary facilities; infections caused by contaminated commercial feeds are less common than those caused by on-farm contamination. However, transport and storage facilities should be evaluated. Also, home-produced feeds should be scrutinized as a potential source of infection. Waste milk is a very common source of pathogens. In a crisis such as this, with a majority of calves becoming sick, it would make sense to completely reevaluate the feeding program if waste milk is used. Who's running the pasteurizer? Is it working correctly – correct temperature? Correct time? If the farm is using a pasteurizer, all aspects of the equipment should be evaluated and all workers retrained on how to use it. Focus on cleaning and sanitation. Don't simply crank up the heat of the pasteurizer or pasteurize for longer periods; this will reduce digestibility of milk proteins and reduce growth of the calves.

Feed storage should be checked, too. Are there pests (rats, birds, etc.) infecting the feed? Although the magnitude of this specific problem is so great that I doubt that minor vermin infestations are responsible, this should be an area of scrutiny. Specifically related to storing milk – how long is it stored, how is it transported, and at what temperature?

How about the help? People are a common vector for transmitting pathogens. Dirty boots, hands, needles, etc. all can infect a calf. It's time for an "all hands" meeting to reinforce the need to clean and disinfect between calves; work with sick calves last; and reinforce protocols on vaccinations, colostrum feeding, etc.

3. Calf housing. This is an aspect of pathogen exposure, but deserves special comment. There are three main areas to consider – sanitation, calf contact, and ventilation.

Sanitation is critical. Putting a calf into a dirty, pathogen-infested pen is a recipe for disaster. Ensure that pens, hutches and fixtures are cleaned and disinfected between calves. Bedding **MUST** be removed and replaced with fresh, non-infected bedding. In a crisis of this

magnitude, the farm and calf managers should take extra care to inspect the quality of disinfection and cleaning of pens.

There are times when the pathogen load is so great within a barn or hutch area that traditional sanitation methods are inadequate. That's when calves need to be moved to a clean, new facility physically separate from the old one. Some farms routinely reposition hutches on "fresh" ground to break the disease cycle and have great success in minimizing disease this way.

Calves that get sick can't pass pathogens on to their neighbors if they can't touch them (and there's adequate ventilation!). Calf to calf contact should be minimized in such a crisis. Notwithstanding all the various benefits to group housing, when calf health is an issue, separating calves is essential. Calves housed in groups should be separated in hutches or pens far enough apart so they can't touch one another, at least until rates of death loss are under control.

Ventilation is critical to calf health. Not only does poor ventilation allow pathogens to build up in the environment, but noxious gases such as ammonia can stress the calf, reducing immunity and predisposing calves to infection. The calf and farm managers should ensure that there's enough air movement to get pathogens out of the environment. Closed barns should be opened up and doors and windows should be opened to allow air movement throughout the barn. Fans may be necessary, or calves may need to be moved outside into a hutch environment.

4. **Maternity area.** Simply put, the shorter time the calf remains in the calving environment after calving, the less the chance for infection. Get the newborn out of the maternity barn and into a clean hutch or pen. Pronto. In crises such as this one, survival of the calf trumps any benefits that may be associated with leaving calf with cow.

If cows are in one large pen at calving, they should be separated from one another. Sanitation is essential – remember, the calf is extremely susceptible to infection right after birth. I've seen far too many maternity areas that were dirty, wet and contaminated. This should be one of the first steps taken – clean up the maternity area and get the calves out of there ASAP after birth.

5. **Commitment.** The culture of caring for calves on the farm must change. Allowing "a majority" of calves to become sick is simply unacceptable. It's easy to find excuses and point fingers, but in such a crisis, *everyone is responsible*. My first comment to management and workers if I were holding the "all hands" meeting is simple. This stops. Now. We will be ALL responsible to solve this problem and we will commit ourselves to identifying and solving the immediate problem within seven days. We will develop and implement biosecurity and protocols to address the issues above. And, at the end of the day, one person (the farm manager) must take full responsibility to implement the plans and monitor progress, but everyone from the manager to every calf feeder must commit themselves to improving the condition on the farm.

I hope that these suggestions might be helpful to producers facing similar challenges. Nobody who works with calves wants to see such crises happen but sometimes, situations spiral out of control and immediate steps must be taken to stop the crisis. Then, longer term improvements can be made to overall management and health practices.

Written by Dr. Jim Quigley (19 May 2013)
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