Evidence-Based Care
For Sick Calves

What's the difference between picking a number in the lottery and winning and the way many persons select a way to treat a sick calf and she recovers? The odds of winning the lottery are higher than the calf recovering!

In contrast, evidence-based care for sick calves is much more dependable. It depends on three steps in sick calf care:

1. **Diagnosing accurately,**
2. **Prescribing for recovery, and**
3. **Monitoring response.**

Summary:

Monitoring response is often the missing step for evidence-based care to work. Without monitoring there is no "evidence." Given that diagnostic criteria are followed consistently and all calfcare persons stick to the treatment protocols, then monitoring treated calves will provide "evidence."

Without records of how well treatments worked the vet is forced to make a "best choice" selection of a treatment regimen. The goal of evidence-based care is, therefore, to add the "farm-specific" experience to the professional's pool of information. End result? Better care for sick calves at a lower cost.

Diagnosing calf illness

Diagnosing calf illness focuses appropriately on diarrhea and respiratory illness since they account for 62 and 21 percent respectively of all preweaned calf deaths. (APHIS: Dairy 2002). Current challenges beyond the perennial problems with cryptosporidiosis include three bacteria enteric illnesses in order of estimated frequency:
(a) colibacillosis,
(b) salmonellosis, and
(c) clostridiosis type A.

Depending on the intensity of bacterial exposure, both enteric colibacillosis and clostridiosis have similar patterns of symptoms. Mortality is high among calves under one week of age. Accurate diagnosis often depends on working closely with your vet to submit fresh samples for laboratory analysis. Frequently sampled tissues include lung, heart, kidney and intestine. Fecal samples often provide helpful information.

Scours symptoms after one week of age frequently are traced back to fecal coliform, salmonella or clostridial bacteria. Breaking the muck-oral transmission route is the primary means of preventing scours from all these three causes.

Prescribing treatment, however, depends on knowing which kind of bacteria are at the root of the problem. This is where laboratory analyses of fecal and tissue samples provide the key pieces of information for accurate diagnosis. In addition, farm-specific history of calf scours is very important as the calf rearer and vet seek an accurate diagnosis.

Bovine respiratory disease (BRD) accounted for 21 percent of preweaned calf mortality in the US 2002 national dairy survey. Current respiratory pathogen challenges in addition to the ever-present *pasteurella multocida* and *mannheimia haemolytica* bacteria are mycoplasma and bovine viral diarrhea virus (BVDV).

In many cases the presenting symptoms among calves two to six weeks of age for the bacterial illnesses are very similar to those caused by BVDV and mycoplasma. This similarity in symptoms causes considerable confusion especially at early stages of both BVD and mycoplasma infections.

Farm-specific history of both BVD and mycoplasmosis is essential for distinguishing between bacterial BRD and these non-bacterial illnesses. Referring to mycoplasmosis, Gawthrop recently observed,

> "The incidence of infection is high in calves that have been fed non-pasteurized waste milk or were fed contaminated colostrum. Also, the infection can spread horizontally." (AABP 2005 p 11)

Thus, if there is a history of mycoplasma mastitis in the herd or mycoplasmosis among preweaned calves, the likelihood of a respiratory illness that is non-responsive to antibiotic treatment being mycoplasmosis is quite high.

In contrast, in the absence of a mycoplasma herd history and no testing program for BVD persistently infected (PI) animals on the farm, multiple cases of respiratory illness that are non-responsive to antibiotic treatment frequently can be traced back to a single PI calf.

Prescribing for recovery

Prescribing for recovery blends two strands of information. One strand is the diagnosis of illness as discussed above. The other strand is the general herd history of antibiotic efficacy.

The vet's general knowledge of the minimum inhibitory concentration of the drug to be achieved for a specified length of time is essential for selecting the best drug, dose and duration of treatment.

Then, the vet must assess the overall farm-specific experience with individual antibiotics in terms of dose, duration of treatment and route of administration among all animals, both youngstock and adult.

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Given several diagnoses for both scours and respiratory illness, the calf rearer and vet can work out "best choice" treatment plans for each. The essential treatment component is sticking to the agreed-on protocol.

For example, the team might agree to treat all cases of rapid, shallow breathing accompanied by a temperature of 39.7° or more with "X" sustained-release drug at the prescribed dose.

Missing, however, from this equation is the herd and disease specific experience among preweaned calves. There might be no records of how well treatments worked. Without this information, the vet makes a "best choice" for a treatment regimen. The goal of evidence-based care is not yet possible.

Monitoring response

Monitoring response is often the missing step for evidence-based care to work. Without monitoring there is no “evidence.” Given that diagnostic criteria are followed consistently and all calfcare persons stick to the treatment protocols, then monitoring treated calves will provide “evidence.”

For example, how often does one treatment with "X" drug at the prescribed dose for calves with respiratory distress and a temperature of 39.7° or more result in a decrease in respiratory distress and near normal temperature within twenty-four hours post treatment?

When setting up protocols for treatments and observing responses, the calf rearer and vet need to agree on the threshold for acceptable response. For the respiratory illness example above, they might settle on an eighty-percent success rate in order to continue using the prescribed protocol.

Similarly, prescribed vaccination protocols can be monitored in the same way. It is very useful to collect disease information before making a vaccination protocol change as well as after the change if an unvaccinated or control group is not available for comparison.

(For additional health related resources, go to www.calfnotes.com, www.atticacows.com, http://www.das.psu.edu/research-extension/dairy/nutrition/calves https://www.extension.purdue.edu/dairy/calves/calfpub.htm http://www.vetmed.wisc.edu/dms/fapm/fapmtools/calves.htm .)

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