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A dairy producer's view of respiratory disease

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Abstract

Respiratory disease is a significant economic burden for United States dairies. Although there has been quality research, there is a need to translate the academic findings to the dairy barn. In particular, there is a need to implement solutions in the context of the economic ramifications of disease management. Plans to combat respiratory disease need to be simple, implemented incrementally and require low 'management energy'. If respiratory disease is prevented at an early age, this will ensure the greatest chance that the animals will reach their full genetic potential to produce.

Keywords: heifer mortality, economics, prevention, colostrum, management

Introduction

Respiratory disease in dairy calves remains a large problem on dairies in the United States. The NAHMS 2007 Dairy study estimated dairy heifer mortality in the United States to be 7.8% for unweaned heifers and 1.8% for weaned heifers. The same study revealed that respiratory disease accounted for 22.5% of unweaned heifer mortality and 46.5% of weaned heifer mortality (USDA, 2007). Losses associated with respiratory disease in dairy replacement animals outpace all other diseases and require well thought out plans to reduce morbidity and mortality.

Veterinarians are well versed in the methods of prevention and treatment of respiratory disease, but sometimes fail to completely understand the economics of respiratory disease. Replacement rearing costs have escalated ($1600–2000 for springers) and dairy profits have tightened significantly, making preventive measures more cost effective. A veterinarian who wishes to make a true difference in the health and economics of a farm must understand how the dairy producer thinks and makes decisions. Most dairy producers want to know three things: how do we stop this now, how much damage has been done and how do we stop it from happening again. Stopping it now involves recognition, diagnosis and treatment. In the author's experience, lack of proper oversight of employees at this point will lead to faulty diagnoses, shotgun therapy, increased drug costs, reduced treatment success and drug residue problems. A typical treatment regime for a heifer will cost $5–10 per 100 lb, depending on the pathogen (i.e. virus versus mycoplasma) and treatment duration. The damage done may be difficult to quantify, possible consequences including no ill effects to subclinical losses (decreased feed efficiency, delayed conception and reduced milk production) to total loss (culling or death) of a genetically superior animal. It is the author's experience that the prevalence of respiratory disease in adult animals is almost non-existent when illness is prevented in younger animals. Stopping it from happening again may require protocol changes, environmental and facility modifications, management and employee education, and monitoring.

Prevention of respiratory disease

Successful prevention strategies require knowledge of risk factors associated with respiratory disease and practical solutions based on science and experience. The measures that are proposed should obviously be cost effective, but must also require little 'management energy'. Simple plans that are implemented incrementally and do not require a great deal of management oversight have much higher chance of success. Vaccination is one example of a low management energy approach; it requires some thought to produce a plan, but then does

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not require much oversight. Plans that require regular data collection and adjustments are harder to implement. Getting employees to 'buy in' to changes will be enhanced by involving them early in the development of procedures and protocols. Consideration of their efforts, struggles and working conditions and recognition of a job well done go far in making positive changes.

The author's experience has been that the most important aspect of a respiratory disease management plan has been prevention, especially in younger animals. In pre-weaned and post-weaned calves, respiratory disease is almost eliminated with optimal passive transfer of colostral immunity, balanced nutrition, proper housing and vaccination. Many studies have shown the associations between passive transfer of immunity and neonatal diseases including diarrhea, sepsis and pneumonia (Donovan, 1998). Colostrum must be administered early enough, be of adequate quality and quantity, and be relatively free from bacterial contamination. Pasteurization of colostrum has been shown to reduce bacterial contamination with little sacrificing of IgG concentration (Godden *et al.*, 2006), if performed correctly. Regular surveillance of the colostrum program must be done through determination of the concentration of IgG in the colostrums, culture of the colostrum and measurements of serum total protein. The calf's diet must account for cold and heat stress, and provide enough nutrition for the calf to feed its immune system and optimize growth. Calves that are provided passive immunity along with proper nutrition are much less likely to experience future respiratory disease.

Calf housing that is appropriate for the season and geographic location is also an important factor in respiratory disease prevention. Depending on the region, cold or heat stress and inadequate humidity play an important role in decreasing the calf's resistance to infection and allowing respiratory pathogens to survive outside the host. Calves should be raised in environments that offer protection from the elements while providing adequate ventilation, access to feed and water, and room to grow. In the author's opinion, calf hutches for pre-weaned calves have proven to be a superior method of housing for disease prevention when compared to crates or calf barns. Group housing for older calves requires adequate resting, feeding and watering space with attention paid to size variation within groups. Attempts by producers to cut housing costs usually result in poor calf health, which actually increases the cost of rearing heifers.

Vaccination of young calves has been the subject of much debate recently, and has been reviewed by Woolums (2007). Much is still not understood about the relationships of colostrum and the neonatal immune system, and when the neonate can mount an adequate response to a modified-live or killed vaccine. It is the author's opinion that other prevention strategies should provide adequate protection so that vaccination of calves should not be necessary until at least 3 weeks of age. However, there has been evidence that calves can mount an immune response to some vaccines during the first few weeks of life. Producers and veterinarians should work together to determine if vaccination in the neonatal period should be part of a respiratory disease management plan.

Conclusion

Even with quality research and proven methods to reduce the incidence of respiratory disease in dairy calves, it continues to be a problem in North American dairies. More work is needed to bridge the gap between academic solutions and those that will work in the 'real world'. Veterinarians need to understand the economic ramifications of disease management plans and effectively convey these to dairy producers. These plans need to be simple, implemented incrementally and require low 'management energy'. Prevention of respiratory disease at an early age will ensure the greatest chance of an animal reaching its full genetic potential to produce.

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