

The BovLine®

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Time to hit the books

Now that school is back in session and we got some rain which cooled the temperatures off, it is beginning to feel like fall. This time of year always stirs up a primal urge in me to hit the books. It must have been those eight years of college that developed some conditioning...

I'm looking forward to my annual trip to the American Association of Bovine Practitioners (AABP) meeting this year in Vancouver, BC. I will be out of town from Wednesday September 19th thru Saturday September 22nd. I will have a veterinarian handle my calls. Because I may not have cell phone coverage, contact my office (244-7851) or Dr. Scanlon Daniels (333-2829) and they will dispatch the on-call veterinarian for you. This is our big opportunity to recruit for our open dairy veterinarian position. We have already posted the job on the AABP website and will target some specific veterinary schools with solid dairy medicine programs.

We've lined up some education for you as well. First, Schering Plough has reserved Dr. Kevin Hill to come and speak in Dalhart on **Thursday September 6 at 6:30** at the Country Club. His topic will be "Advances in Neonatal Immunology".

Next, based on some feedback from our clients, we will initiate our first round table discussion. The idea is to bring together dairy folks and have an open discussion about any topics of choice. The idea is to provide an opportunity for those in the dairy industry to learn from each other. In our busy lives, we don't take time to call or visit each other nearly enough. These discussions will give you an excuse to do just that. Our first one is set for **Thursday October 4 at 6:30 pm** at Rookies.

Angela

Pasteurella pneumonia 101

Respiratory illnesses in cattle cost the industry millions of dollars each year. In dairy calves 0-6 months of age it is the second leading cause of mortality behind diarrhea and may account for at least half of all morbidity and mortality in young calves. The highest incidence of respiratory disease in young dairy calves usually occurs from birth to around six months of age.

The most frequent cause of bacterial pneumonia isolated out of diagnostic submissions in this region is *Pasteurella multocida*. Another species of Pasteurella, now renamed *Mannheimia hemolytica*, is also common. *Pasteurella multocida* is a gram negative bacteria. It is found worldwide in a wide distribution of hosts, including humans. Most are commonly found on normal mucous membranes, including the nasal cavity and upper respiratory tract.

The pathogenesis of the disease is not fully understood. Once the organism gains access to the lung, pulmonary defenses generally clear the bacteria within hours. Predisposing stress factors will either allow more bacteria into the lung or depress the ability of the lung to clear these bacterial deposits or a combination of both will occur. Dust, viral agents, weaning or shipping stress and weather fluctuations are some predisposing stress factors commonly seen in dairy operations. Once in the lung, *Mannheimia hemolytica* is able to proliferate rapidly within the lung and with the aid of its toxins produce a severe fibrinopurulent bronchopneumonia.

A good diagnosis is important. It is impossible to diagnose the causative agent on a gross necropsy. It is important to understand if any predisposing viral agents are involved in the pneumonia process. It has been proven that calves infected with respiratory viruses, including parainfluenza, bovine viral diarrhea (BVD), bovine respiratory syncytial virus (BRSV), infectious bovine rhinotracheitis (IBR), have increased susceptibility to severe bronchopneumonia when exposed to *Pasteurella multocida*.

If the animal has been untreated with antibiotics, a bacterial sensitivity on isolated bacteria is very useful. It is important to understand that this diagnostic test is performed in a laboratory taking the isolated organism and exposing it to a known concentration of antibiotic and reporting out the growth inhibition of that bacteria to particular antibiotics. This test is only a prediction of how a live animal will respond to treatment. It is merely a hedge as to which antibiotics should work and it tells us which ones to stay clear of. Past experience and current drug labeling tells us that the best antibiotic choices for treating *Pasteurella pneumonia*s are Ceftiofur, Enrofloxacin, Florfenicol, Spectinomycin, Tilmicosin and Tulathromycin. The challenge for treating lactating dairy cattle is that most of these antibiotics are illegal to use because of the milk residue.

Pasteurella pneumonia cont.

Early identification and immediate treatment are key to successful case outcomes. In addition to antibiotic therapy, a fever-reduction agent should be administered as well as additional supportive care. Note and treat for any dehydration and supplementation of vitamins is common. The use of intranasal temperature-sensitive IBR vaccine has also been suggested to help provide a nonspecific immune stimulant. The degree of lung damage can generally dictate by how well the animal responds to antibiotic treatment.

Failure of passive transfer leaves the calf vulnerable to many diseases, including respiratory disease. Lack of colostrum raises the risk the calf will be treated for pneumonia at any early age because it may be breathing hard due to an acidosis secondary to diarrhea and sepsis.

Proper nutrition is also key to preventing respiratory problems. The immune system requires a suitable plane of nutrition in order to operate effectively. It has been estimated that close to twenty-five percent of the daily energy fed to a calf is used by the immune system alone, according to Lance Fox, DVM with Alpha Animal Health. Levels of protein are crucial in calf diets and proper care should be taken in calves that are not consuming significant amounts of milk replacer to provide them with adequate protein intake.

I was taught in veterinary school that *Pasteurella* vaccines do not work. Luckily, times have appeared to change. Over the past five years, technology has brought several one dose products to the market. We can continue to see advancements in this area. Not much data is available on the use of these products adult lactating dairy animals. Anecdotally, these vaccines have been rumored to drop milk production. I do believe that a *Pasteurella* vaccine has a place in replacement heifer programs that experience respiratory challenges. Depending on the age and weight of the cattle, the breakeven on using a vaccine may be as little as treating five head with antibiotics or reducing mortality by one head.

In summary, *Pasteurella pneumonia* is prevalent in the Texas Panhandle. The key to prevention is a sound vaccination program to reduce viral challenges and to provide a low stress environment. Treatment can be a challenge on adult cattle because of the short list of available antibiotics. When caught early enough, calves have decent treatment success rates. The addition of *Pasteurella* vaccine may be cost effective and warranted in some replacement calf programs.

Comparison of *Pasteurella* Vaccines

	Respishield MH	One Shot	Pulmo-Guard PHM-I	Presponse HM	Presponse SQ	Once PMH SQ
Vaccine type	Bacterin-toxoid	Bacterin-toxoid	Bacterin-toxoid	Bacterin-toxoid	Toxoid	Avirulent Live Culture
Manufacturer	Merial	Pfizer	Boehringer	Fort Dodge	Fort Dodge	Intervet
Mannheimia haemolytica	x	x	x	x	x	x
<i>Pasteurella multocida</i>	x		x	x		x
Preparation	Ready to use	Rehydrate	Ready to use	Ready to use	Ready to use	Rehydrate
Dosage	2 mL 1 dose	2 mL 1 dose 14 days prior to stress	2 mL 1 dose	2 mL 1 dose; cattle 7 months of age or older; 21 days prior to stress	2 mL 1 dose; cattle 3 months of age or older; 14 days prior to stress	2 mL 1 dose 3 months of age or older
Meat withdrawal	60 days	21 days	60 days	21 days	21 days	21 days
Label precautions	Small nodules at injection site	Moderate swellings	Persistent swelling at injection site	Transient injection site reactions	Not indicated	Not indicated
Presentation	10 and 50 dose	5, 10 and 50 dose	10 and 50 dose	10 and 50 dose	10 dose	10 and 50 dose