

Prevalence of *Mannheimia haemolytica* Biotype A Serotypes in Cattle from Multiple Regions of the United States

The purpose of this technical bulletin is to present and compare prevalence findings of *Mannheimia haemolytica* (Mh) serotypes A1 (MhA1) and A6 (MhA6) isolated from lung tissue samples collected at diagnostic labs across the country as well as introduce clinical observations to substantiate the importance of ensuring vaccination protocols are designed to provide adequate protection against the most appropriate serotypes of *Mannheimia haemolytica*.

It is well-documented that Bovine Respiratory Disease (BRD) – commonly referred to as “shipping fever” – is the most common and costliest disease affecting beef and dairy cattle annually in the United States. The multi-factorial disease complex impacts animal productivity through a variety of physical and physiological stressors which combine to predispose cattle to pneumonia.

The primary bacterial contributor to BRD is *Mannheimia haemolytica* (formerly known as *Pasteurella haemolytica* before being reclassified

based on DNA-DNA hybridization studies by Angen et al).⁷ *M. haemolytica* is an opportunistic pathogen that normally colonizes and proliferates in the upper respiratory tract of cattle when host defenses are compromised by stress and/or infection with other bacterial or viral pathogens or *Mycoplasma bovis*. MhA1 is the most commonly isolated *M. haemolytica* serotype from pneumonic lesions.^{1,2,3,4,5,6}

In order to prevent BRD, a producer often works with their veterinarian to develop and implement a vaccination protocol specific to their operation type, class of cattle and region. While there are a number of different variables and risk factors that need to be considered when designing these protocols, ultimately the goal is to strengthen their cattle’s immune system against common viral and bacterial pathogens. As it pertains to *Mannheimia haemolytica*, almost all of the commercially available vaccines on the market include only the most common serotype: MhA1.

The tables on this page present the number (Table 1) and percentage (Table 2) of *M. haemolytica* serotypes isolated from 960 lung tissue samples. These samples were submitted to diagnostic laboratories in the upper Midwestern United States (Minnesota, South Dakota, Michigan)

Table 1: Number of *M. haemolytica* serotypes A1 and A6 isolated from lung samples

SOURCE	SEROTYPE		
	A1	A6	TOTAL
Upper Midwest U.S. Diagnostic Laboratories	85	38	123
Bimeda Biologicals Diagnostic Laboratory	736	101	837

Table 2: Percentage of *M. haemolytica* serotypes A1 and A6 isolated from lung samples

SOURCE	SEROTYPE	
	A1	A6
Upper Midwest U.S. Diagnostic Laboratories	69.1%	30.9%
Bimeda Biologicals Diagnostic Laboratory	87.9%	12.1%

between 1997-1999 (published in 2000 in the Journal of Veterinary Diagnostic Investigation by Al-Ghamdi et al.) and the Bimeda® Biologicals diagnostic lab (formerly Texas Vet Lab®/VetBio®) in San Angelo, Texas, between 2010-2019.^{8,9}

These diagnostic lab findings support previously reported findings that identified MhA1 as the most commonly isolated Mh serotype (85.5%). The data also shows, however, that MhA6 was identified as being the primary disease-causing pathogen in 14.5% of the pneumonic lung lesions sampled.^{8,9}

In addition to the diagnostic findings, multiple veterinarians utilizing Bimeda





Biologicals' diagnostic laboratory have repeatedly communicated that their clinical observations led them to believe that MhA6 infection is a fast-acting (peracute) disease, which sometimes

presents as being more virulent and refractory to treatment than MhA1.

Therefore, using a vaccine that includes only MhA1 may only provide partial

protection and, according to the data, be leaving as much as 30.9% of potential infection and subsequent disease from *Mannheimia haemolytica* uncovered.^{8,9}

IS YOUR VACCINATION PROTOCOL ADDRESSING THE MOST COMMON BRD-CAUSING BACTERIA?

The table below compares antigens included in commercially available bacterial vaccines.

PRODUCT NAME	MANUFACTURER	TYPE	MIXING REQUIRED	ROA	MhA1	MhA6	Pm	Hs	St	IBR	BVD
One Shot®	Zoetis	Killed	Yes	SQ	●						
Presponse® SQ	Boehringer Ingelheim	Killed	No	SQ	●						
Presponse® HM	Boehringer Ingelheim	Killed	No	IM	●		●				
Once PMH® IN	Merck Animal Health	Avirulent Live	Yes	IN	●		●				
Once PMH® SQ	Merck Animal Health	Avirulent Live	Yes	SQ	●		●				
Pulmo-Guard® PM-M	AgriLabs	Killed	No	SQ	●		●				
Pulmo-Guard® PHM-1	AgriLabs	Killed	No	SQ	●		●				
Nuplura® PH	Elanco	Killed	No	SQ	●						
Pro-Bac™ 2	Bimeda Biologicals	Killed	No	SQ	●	●					
Pro-Bac™ 3	Bimeda Biologicals	Killed	No	SQ	●	●	●				
Pro-Bac™ 4	Bimeda Biologicals	Killed	No	SQ	●	●	●	●			
Pro-Bac™ 5	Bimeda Biologicals	Killed	No	SQ	●	●	●	●	●		
Pro-Bac™ 4 + IBRk & BVDk	Bimeda Biologicals	Killed	No	SQ	●	●	●	●		●	●

Mh: *Mannheimia haemolytica*; Pm: *Pasteurella multocida*; Hs: *Histophilus somni*; St: *Salmonella typhimurium*; IBR: *Infectious Bovine Rhinotracheitis*; BVD: *Bovine Viral Diarrhea*

Bimeda Biologicals' PRO-BAC™ vaccines are the only bacterial vaccines on the market that include the two most common serotypes of *Mannheimia haemolytica* (MhA1 + MhA6), offering the most complete protection against the primary contributor to bacterial pneumonia, a major component of BRD. There are several different combinations of PRO-BAC vaccines available that also include protection against *Pasteurella multocida*, *Histophilus somni* and *Salmonella typhimurium*.

Bimeda Biologicals utilizes a variety of specialized manufacturing techniques to ensure that all of their vaccines are safe and efficacious. The PRO-BAC vaccines come ready to use

(do not require chute-side mixing) and contain Reveal ATS™ – a proprietary adjuvant system specifically developed to optimize cattle's immune response in order to maximize protection.

Talk to your veterinarian or animal health supplier to learn which PRO-BAC vaccine best fits your needs.



To learn more about Bimeda Biologicals products and services, go to bimedabiologicals.com

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