



## High Altitude Disease (HAD) in Beef Cattle

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Approximately one-third of the beef cattle produced in New Mexico come from elevations of 5000 ft or greater. A common ailment of cattle raised at these elevations is known as Brisket disease, specifically bovine high-altitude pulmonary edema (BHPE) or high-altitude disease (HAD). Affected cattle have trouble coping with lower oxygen levels, causing the heart to work harder, resulting in fluid accumulating within the pericardial sac, and eventually leads to edemas about the lungs and brisket region. The inefficiency of oxygen transfer makes them more susceptible to other respiratory infections as well.

Symptoms of brisket disease may include:

1. Difficulty breathing or rapid breathing
2. Coughing
3. Increased respiratory rate
4. Decreased exercise tolerance
5. Bluish discoloration of the mucous membranes (cyanosis)
6. Swelling in the brisket area

Brisket disease can be fatal if not promptly diagnosed and treated. Treatment typically involves moving affected cattle to lower altitudes, where oxygen levels are higher, and supportive care such as administration of oxygen and diuretics to reduce fluid accumulation in the lungs. Prevention strategies include avoiding abrupt changes in altitude and providing supplemental oxygen or altering feeding practices to reduce the risk of brisket disease in susceptible cattle populations.

It's important for cattle producers and veterinarians in high-altitude regions to be aware of brisket disease and take appropriate measures to mitigate its effects, especially during times of increased stress or rapid changes in altitude.

One method of disease monitoring is physically testing your cattle for HAD susceptibility. This test measures pulmonary arterial pressure (PAP), and refers to the pressure within the pulmonary artery, which is the blood vessel that carries deoxygenated blood from the heart to the lungs for oxygenation.

Elevated PAP can indicate various health issues in beef cattle, such as:

1. **Pulmonary Hypertension**: This condition involves increased pressure in the pulmonary arteries, which can lead to heart failure and reduced exercise tolerance in cattle.
2. **Respiratory Diseases**: Respiratory conditions such as pneumonia or chronic obstructive pulmonary disease (COPD) can lead to increased PAP due to inflammation or obstruction in the lungs.
3. **Heart Diseases**: Certain heart conditions, such as congenital defects or valvular disorders, can cause increased pressure in the pulmonary artery.
4. **High-Altitude Disease**: In regions with high altitudes, cattle can develop high-altitude pulmonary hypertension (HAPH), a condition where decreased oxygen availability leads to increased PAP. Monitoring PAP in cattle typically involves specialized equipment such as catheters and pressure transducers, which are inserted into the pulmonary artery to directly measure the pressure. This procedure is often performed by veterinarians in clinical settings, particularly when investigating suspected cardiovascular or respiratory issues.

Managing and treating elevated PAP in beef cattle may involve addressing the underlying cause, such as providing appropriate medication for respiratory diseases, optimizing environmental conditions (especially in high-altitude regions), and implementing management practices to reduce stress and improve overall health. Regular veterinary check-ups and monitoring are crucial for early detection and management of conditions affecting pulmonary arterial pressure in beef cattle.

What constitutes a "good" PAP score can vary depending on the altitude and the specific breeding goals of the operation. Generally, a PAP score below a certain threshold is considered desirable for cattle that will be raised or used for breeding at high altitudes. The exact threshold may vary, but in some cases, a PAP score of 40 mmHg or lower is considered acceptable for high-altitude adaptation.

It's important to note that PAP scores should be interpreted in the context of the altitude at which the cattle will be living or working. What might be considered a good PAP score at one altitude may not be suitable for another. Additionally, other factors such as breed, age, and overall health should also be taken into consideration when evaluating PAP scores. Cattle should be managed at elevations greater than 6000 feet for a minimum of 45 days before being tested for PAP.

Cattle breeders and producers often use PAP scores as part of their selection criteria when choosing breeding stock or purchasing animals for high-altitude environments. By selecting cattle with lower PAP scores, they aim to reduce the risk of brisket disease and improve overall productivity and health in these challenging environments.

Research has shown that there is a genetic link to susceptibility of HAD. Heritability is estimated to be approximately 35%. Therefore, having bulls tested for PAP is recommended at higher altitudes. The American Angus Association has developed an EPD for "PAP", so that producers can make selection decisions that will reduce the risk of HAD development. A lower PAP EPD is more desirable in Angus cattle raised in higher altitudes.

In 2023, the New Mexico Cattle Marketing association, located in Rio Arriba County established a bull development program. Producers from across the state brought yearling and two year old bulls to the NMCMA facility, located in Abiquiu, NM for 60 days. Dr. Andrea Gutierrez, DVM will be performing PAP testing on the bulls this month. **On Saturday March 29<sup>th</sup>**, these bulls will be sold to regional producers. Buyers will not only have genetic information, but actual PAP scores of each bull. This is a unique opportunity for producers to try and reduce the risk of HAD in their herd.

For more information about the High-Altitude Bull Sale, contact Marcy Ward at 575-644-3379



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