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HIGH ALTITUDE DISEASE, PAP, FEEDLOT HYPERTENSION, AND RESPIRATORY ISSUES

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1. BRISKET DISEASE, or congestive heart failure, IS NOT UNIQUE TO HIGH ALTITUDE
2. Congestive heart failure is becoming INCREASINGLY PROBLEMATIC
3. TAKE A CLOSER LOOK – it may not be a chronic pneumonia!

OVERVIEW

1. Background: the various types of heart failure
2. What is congestive heart failure?
3. What are we doing to manage it?
4. How big of a problem is it? And what are the risk factors?
5. How do pulmonary arterial pressures change with age?
6. Summary
The current understanding of brisket disease

Flow = Pressure difference / Resistance

Congestive heart failure causes water in the blood vessels to pool in body cavities and under the skin in lower body regions.

Increased pressure in capillaries

Water pressure in the tissues surrounding the blood vessels
So what is being done?
The importance of PAP screening of the breeding herd

<table>
<thead>
<tr>
<th>Variable</th>
<th>Survived</th>
<th>Died</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean PAP, mm Hg</td>
<td>51</td>
<td>6</td>
<td>&lt; 0.001</td>
</tr>
<tr>
<td>Mean ± SD</td>
<td>39.5 ± 5.1</td>
<td>48.8 ± 11.1</td>
<td></td>
</tr>
</tbody>
</table>

Calves with high PAP at 3 months of age are significantly more likely to die of brisket disease.

Congestive heart failure is becoming INCREASINGLY PROBLEMATIC
How big of a problem is congestive heart failure?

Study of 1.6 million cattle
Feedlot Health Management Services (Okotoks, AB, Canada) provided the data.
10 Canadian feedlots: 657-1,145 m (2,150 - 3,760 ft.)
5 US feedlots: 596-1,282 m (2,000 - 4,210 ft.)

Risk of CHF from the year 2000 to the year 2012

<table>
<thead>
<tr>
<th>Year</th>
<th>Disease</th>
<th>Mean</th>
<th>95% CI</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>2000</td>
<td>CHF</td>
<td>0.27</td>
<td>0.18, 0.37</td>
<td>ref.</td>
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<tr>
<td></td>
<td>DD</td>
<td>1.75</td>
<td>1.32, 2.19</td>
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</tr>
<tr>
<td>2004</td>
<td>CHF</td>
<td>0.37</td>
<td>0.26, 0.47</td>
<td>0.18</td>
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<tr>
<td></td>
<td>DD</td>
<td>1.77</td>
<td>1.40, 2.15</td>
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<tr>
<td>2008</td>
<td>CHF</td>
<td>0.61</td>
<td>0.45, 0.78</td>
<td>&lt; 0.001</td>
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<tr>
<td></td>
<td>DD</td>
<td>2.32</td>
<td>1.82, 2.81</td>
<td></td>
</tr>
<tr>
<td>2012</td>
<td>CHF</td>
<td>0.52</td>
<td>0.37, 0.67</td>
<td>0.003</td>
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<tr>
<td></td>
<td>DD</td>
<td>2.82</td>
<td>2.13, 3.50</td>
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</tr>
</tbody>
</table>

How do pulmonary arterial pressures change with age?

Mean PAP, mm Hg

BRISKET DISEASE IS NOT UNIQUE TO HIGH ALTITUDE

2015 Range Beef Cow Symposium, Loveland, Colo.
Right ventricular hypertrophy with heart failure in Holstein heifers at elevation of 1,600 meters

Christopher R. Malherbe, Jena MacQuarrie, David E. Lago, Kristi M. Cammack, Donald O'Toda

Abstract: A subset of progeny—right-sided heart failure occurred among mating Holsteins at a high-mountain facility and 2 facilities in the Colorado Plateau range between 2007 and 2013. Most cases were in the Holstein offspring, which the disease has not been observed in an outbreak of 85 calves from 201. The disease included a sudden death or premature death of 35 animals over 3 years. Clinical progression in most cases was mild to moderate, but some developed a severe type of clinical presentation. Over 20 cases, 15–208 days earlier than Holstein mortality (n = 279), the mass mortality was due to arrested development of cases, leading us to propose a hypothesis of right ventricular hypertrophy, observed as a complication of right ventricular hypertrophy, and development of a syndrome, and pulmonary edema, as well as hypereosinophilic syndrome, and ventricular arrhythmia.

TAKE A CLOSER LOOK – it may not be chronic pneumonia!

An investigation into beef calf mortality on five high-altitude ranches that selected sires with low pulmonary arterial pressures for over 20 years

Joseph M. Neary, Daniel B. Gould, Franklin B. Garry, Anthony P. Knight, David A. Dargate, Timothy N. Holt

Abstract: Producers report that mortality rates of calves born above 2,500 meters have increased dramatically in recent years, and that these calves are at greater risk of death and may be at risk for other complications. The objective of the current study was to determine the causes of death in calves born at 3,000 meters or higher in the southern U.S. A total of 20 calves were included in the study and were collected from 5 different ranches in the southern U.S. The calves were divided into 4 groups based on the presence or absence of clinical signs of respiratory distress. The group of calves with clinical signs of respiratory distress had a significantly higher prevalence of pneumonia than the group without clinical signs of respiratory distress. The group of calves with clinical signs of respiratory distress also had significantly higher prevalence of pneumonia than the group without clinical signs of respiratory distress.

Summary

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2. Congestive heart failure is becoming INCREASINGLY PROBLEMATIC
3. TAKE A CLOSER LOOK – it may not be chronic pneumonia!
Thank you

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…the answer to your first question.