

## Submandibular Oedema in Cattle

Submandibular swelling is commonly seen in cattle. It is often attributed to hypoalbuminaemia due to Johne's disease, however, there are other causes for oedema formation, and other disease processes which result in localised swelling. If Johne's serology is negative, consider checking serum albumin or a sick animal panel to investigate other potential processes.

### Differentials for submandibular swelling

1. Oedema
  - a. Hypoalbuminaemia
    - Johne's disease
    - parasitism
    - hepatic insufficiency
    - severe renal disease
  - b. Increased hydrostatic pressure
    - congestive heart failure
  - c. Lymphatic obstruction
    - trauma
    - mass: granulation tissue, abscess
    - lymph node dysfunction – metastatic disease
2. Infection
  - a. Woody tongue
  - b. Salivary abscess
  - c. Infected tooth
  - d. Lumpy jaw
  - e. Bovine ephemeral fever virus (this is a notifiable disease in NZ)
3. Trauma
4. Dermatitis

### Oedema

There is a constant flux of fluid between the vasculature and interstitial tissue with flow determined by hydrostatic pressure, colloid osmotic pressure and lymphatic flow. In a healthy animal there is no net flow, however, if any of these parameters are altered sufficiently (there is a safety margin) then tissue fluid accumulation occurs.

### Elevated Hydrostatic Pressure (HSP)

HSP forces fluid out of the vascular space into the interstitial space. Increases in HSP sufficient to cause submandibular oedema may be seen with right sided heart failure (distended jugular veins, jugular pulses, tachycardia, and systolic murmur will also be noted)

### **Reduced Colloid Osmotic Pressure**

Colloid osmotic pressure encourages fluid to flow from tissue back into the vascular space. Albumin is a significant contributor to COP and a marked reduction favours fluid accumulation. Marked hypoalbuminaemia can occur in end stage liver disease, GI protein loss and in renal protein loss (uncommon in ruminants).

### **Lymphatic Drainage**

Lymphatic drainage is the major route by which interstitial fluid is removed from tissue and lymphatic dysfunction will cause oedema. Lymphatic obstruction can be due to tumours, lymph node metastases, trauma, abscesses or granulation tissue. Increased venous pressure may also decrease lymphatic drainage.

### **An exotic disease which may cause submandibular oedema**

Bovine ephemeral fever is a viral disease that is exotic to New Zealand. Transient, bi- or tri-phasic severe illness includes signs of fever, depression, weakness, tachypnoea, tachycardia, joint/muscle pain, marked drop in milk production ± submandibular oedema are seen.

