Auscultation of the Respiratory System
Bovine Lung Field

- The bovine lung field is relatively small

- Breath sounds can be heard in a triangle formed by:
  - the triceps cranially,
  - the attachment of the ribs to the vertebral column dorsally
  - an imaginary line joining the point of the elbow with the eleventh intercostal space

- Lung sounds are loudest in mid thorax
Auscultation of the Respiratory System

- Auscultation of the respiratory system includes listening to the trachea and lungs

- Normal respiratory rates in ruminants are very similar:
  - Cattle: 18 – 35
  - Calf: 20 – 40
  - Goat: 15 - 30
  - Kid: 20 - 40
  - Sheep: 12 - 20
  - Kid: 20 – 40

- Abnormal sounds:
  - Crackles, wheezes, bronchial sounds
Normal sounds

- Trachea
  - Large airway sounds are normally sound
  - Sound like air moving through a large tube
  - Less turbulence

- Lungs
  - Lung sounds are soft
  - Abnormal sounds are characterized as:
    - Crackles
    - Wheezes
    - Bronchial sounds
Abnormal Sounds: Trachea

- Abnormal tracheal sounds are often associated with narrowing of the upper airway and/or fluid accumulation in the trachea.

- Disease that can result in tracheal pathology include:
  - Necrotic laryngitis
  - Infectious bovine rhinotracheitis (IBR)
  - Parainfluenza 3
  - Pulmonary edema
  - Bronchopneumonia
  - Parasitic pneumonia
  - Aspiration pneumonia
Abnormal Breath Sounds: Bronchial Tones

- Bronchial tones are associated with:
  - Consolidated lung
    - Bronchopneumonia – cranial ventral consolidation
  - Atelectasis
    - Collapsed lung – prematurity, severe consolidation, pleural effusion
- Bronchial tones sound like tracheal sounds only not as loud
- Mostly heard in the cranial ventral area of the lung – best on the right side
  - Bronchopneumonia pathogenesis
Abnormal Breath Sounds: Crackles

- Crackles occur when fluid is present in the lower airways
  - The fluid can be purulent or serous
  - Often heard with broncho- and viral pneumonias
- Crackles are discontinuous sounds because their intensity fluctuates
  - Fine crackles fluctuate rapidly in intensity - may be produced by airways snapping open
    - Sometimes associated with emphysema
  - Coarse crackles fluctuate more slowly and have a lower frequency
    - Coarse crackles are produced by fluid movements within the larger airways.
Abnormal Breath Sounds: Wheezes

- Wheezes are created by narrowing of the airways
  - Airways are narrowed by:
    - Smooth muscle constriction
    - Mucous
  - Wheezes can be heard in animals with allergic airway disease (asthma), viral pneumonia, bacterial pneumonia, and parasitic pneumonia
- Wheezes can be described as continuous sounds because the intensity gradually decreases during their length
- Squeaks are sometimes regarded as a sub type of wheezing sounds.
Auscultation of the Heart
Cardiac Auscultation

- Heart sounds are best heard under the triceps/elbow between the 3<sup>rd</sup> and 5<sup>th</sup> intercostal spaces on the left side but can be heard on the right side
  - The heart sounds are difficult to hear but if the stethoscope is pushed far cranially, under the elbow, the heart sounds are audible
  - Usually heart sounds are loudest on the left side when the stethoscope head is completely hidden by the triceps mass
- The normal heart rate is 50 to 80 beats/minute
Auscultation of the Heart: Normal Heart Sounds

• **Only the first two sounds heart sounds are heard**
  - S1 the first heart sound is the loudest and is associated with the closure of the atrioventricular valves
    - **It is loudest at the 4th intercostal space**
  - S2 is heard shortly after S1 and is associated with the closure of the aortic and pulmonic valves
    - **It is loudest at the 3rd intercostal space**
Auscultation of the Heart: Arrhythmias

- **Arrhythmias are disturbances in the normal heart rhythm**
  - Regularly irregular
    - Bradycardia
    - Tachycardia
    - Premature ventricular contractions located in a single foci
    - Sinus bradycardia
  - Irregularly irregular
    - Atrial fibrillation
    - Paroxysmal supraventricular tachycardia
    - Ventricular tachycardia
    - Premature ventricular contractions
  - In cattle arrhythmias are often associated with electrolyte imbalances
    - Hypokalemia
Auscultation of the Heart: Murmurs

- Murmurs are created by turbulent blood flow in the heart
- The most common causes of heart murmurs in cattle is endocarditis
  - The intensity of the murmur will depend on location – AV valves, aortic, or pulmonic
- Calves with foot and mouth disease may have cardiomyopathy, which may create a murmur
- Murmurs may also be heard with anemia, cardiomyopathy, and congenital anomalies such as ventricular septal and atrial septal defects
Auscultation of the Heart: Pericarditis

- Traumatic reticulopericarditis (hardware disease) can create abnormal lung sounds
  - Sloshing sound generated by an air – fluid interface
  - Only occurs if gas producing bacteria are present
    - Most rumen flora are gas producing organisms
Auscultation of the Gastrointestinal Tract
Auscultation of the gastrointestinal (GI) tract should include the rumen, large and small intestines

- The rumen is the only distinct sound that can be heard
  - It will be heard best in the paralumbar fossa
  - A normal contraction will cause the rumen to bulge in the paralumbar fossa

- Small and large bowel will sound similar and can be somewhat discerned by anatomy
  - Both can be heard on the right side
  - The spiral colon and cecum are best heard in the right paralumbar fossa
Gastrointestinal Auscultation: Abnormal Sounds

- Tympanic sounds are heard when percussion and auscultation are done simultaneously
  - Caused by a gas filled viscous

- What are the most common causes of tympany on the left side?
• What are the most common causes of tympany on the right side?