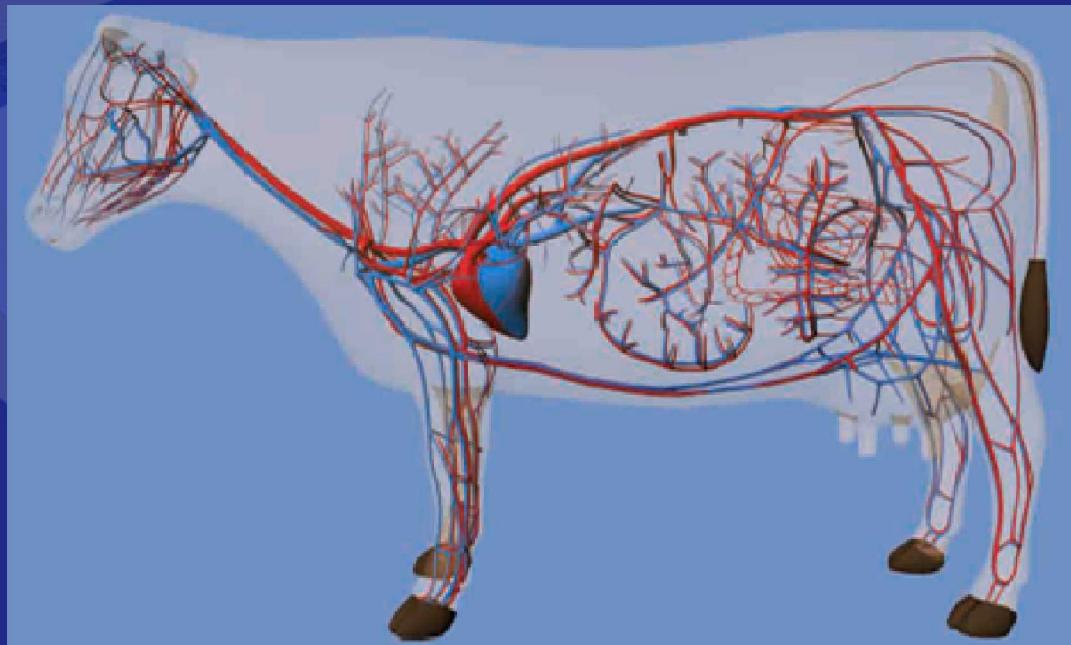
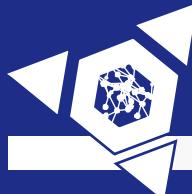


Examination of the Cardiovascular System



Sandia is a multiprogram laboratory operated by Sandia Corporation, a Lockheed Martin Company, for the United States Department of Energy's National Nuclear Security Administration under contract DE-AC04-94AL85000.
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Examination from Afar: Cardiovascular System

- **Information collected during an examination from a distance**

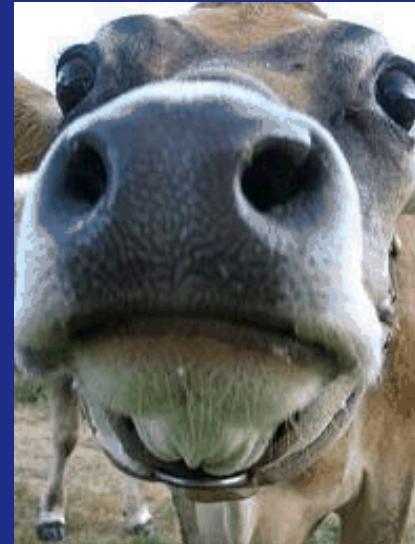
- General body condition
- Edema
- Ease of respiration
- Respiratory rate
- Coughing
- Nasal discharge
 - **Blood**
 - **Serous**
- Jugular vein distension/pulsation
- Cranial abdominal pain
- Hydration status
- Licking nose
- Chewing cud





Collecting a Meaningful History: Cardiovascular System

- **Historical information related to the cardiovascular system evaluation**
 - Duration of illness
 - Difficulty breathing
 - Coughing
 - Nasal discharge
 - Vaccinations
 - Previous treatments - magnet
 - Food and water consumption
 - Calving/lambing history
- **Historical information related to the herd**
 - Other animals affected
 - Duration of signs
 - Similarity of signs
 - Deaths associated with the illness
 - Changes in food and/or water
 - New additions to the herd





Examination: Cardiovascular System

- **Pulse**
 - Middle coccygeal artery: cattle
 - Femoral artery: sheep and goats
- **Mucous membranes**
 - Color
 - Dryness
- **Nasal discharge**
- **Facial symmetry**
 - Edema
 - Eye position in the globe
- **Sclera**
 - Color
 - Edema
- **Jugular vein distention**
- **Edema**
- **Milk vein pulsation**
- **Palpate lymph nodes**





Examination: Cranial Abdominal Pain

- **Withers pinch test**



- **Grunt test**





Examination: Cardiac Auscultation

- **Anatomy**

- Cattle: majority of the heart is in the left hemithorax
 - **Heart sounds are best heard on the left side**
 - Pulmonic valve: 3rd intercostal space
 - Aortic valve: 4th intercostal space
 - AV (mitral) valve: 5th intercostal space
 - **The heart can be heard on the right side at the third intercostal space**
 - Right AV valve: 3rd intercostal space
 - Stethoscope must be pushed far cranial
- Sheep and goats: majority of the heart is in the left hemithorax
 - **Left side: 2nd to 5th intercostal spaces**



Examination: Cardiac Auscultation

- **Auscultation**

- Heart rate:
 - **Cattle: 60 – 80 beats / minute**
 - **Calves: 110 – 120 beats / minute**
 - **Sheep: 70 – 80 beats / minute**
 - **Goats: 70 – 90 beats / minute**
 - **Lambs and kids: 120 – 140 beats / minute**



- Regular rhythm:
 - **Skipped beats**
 - **Irregularities**
 - **Should listen for a full minute or longer**

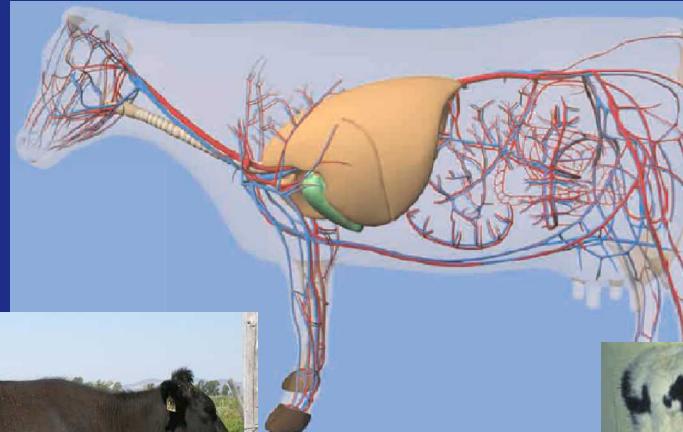
- Sounds
 - **Intensity of sounds**
 - Endocarditis versus pericarditis
 - Electrical alterans
 - **S1 and S2 can be heard in sheep, goats, and cattle**
- Listen closely for murmurs

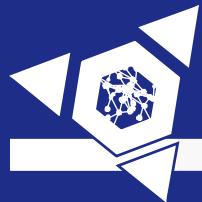




Interpretation of Results: Cardiovascular System

- **Abnormal findings: cardiovascular system**





Ancillary Tests: Cardiovascular System

- **Electrocardiography**
- **Ultrasound examination (echocardiography)**
- **Radiography**
- **Hematology**
- **Microbiology**