

APPENDIX 6

PHYSICAL EXAMINATION: SMALL RUMINANT



BASICS

OVERVIEW

- Physical examination entails systematic evaluation of an animal's body. In small ruminants the procedure is generally performed from anterior to posterior and dorsal to ventral and includes auscultation of the heart and lungs. Additionally, activity/behavior (e.g. lethargy, seizures), anatomy (e.g. body condition score, tumors, lacerations, fractures), and indicators of systemic physiology (e.g. increased respiration, heart rate, temperature) are assessed.
- The physical examination identifies abnormalities that, along with the history, allow formulation of appropriate differential diagnoses. Diagnostic tests may then be selected and performed to gain more information and to refine the list of possible differential diagnoses.
- The development of a problem list, differential diagnosis list, and working or final diagnosis is intimately linked with successful physical examination. Prevention, treatment, and management options can then be methodically developed.
- The detection of disease, and the organ systems affected occurs during the examination procedure. There are three types of examination: comprehensive examination, screening examination, and emergency or limited examination.
- A complete, thorough examination is not time-consuming or expensive, and is essential to formulate a complete and accurate diagnosis.

INCIDENCE/PREVALENCE

- N/A

GEOGRAPHIC DISTRIBUTION

- Worldwide

SYSTEMS AFFECTED

- Multisystemic

PATHOPHYSIOLOGY

- N/A

HISTORICAL FINDINGS

- N/A

SIGNALMENT

- Sheep, goats

GENETICS

N/A

HISTORICAL FINDINGS

- Prior to beginning the clinical examination retrieve information regarding the presenting problem(s), the signalment (age, sex, production group), history of the animal(s) affected, and other relevant information. The history should encompass the type, onset, and duration of clinical signs, and epidemiologic data such as the number of affected animals and the distribution of disease in the flock or herd.

PHYSICAL EXAMINATION FINDINGS

- Sheep, camelids, and goats are generally alert and somewhat flighty, with a strong desire to run away from the observer. This normal behavior allows one to compare sick animals with healthy ones. Sick animals will closely follow the flock or herd movements to the best of their ability but may lag or be completely unable to keep up.
- Observe the patient to evaluate locomotion, mentation, breathing, urination, and defecation behavior. For a successful assessment of the patient's health, it is vital to use information from both the history and physical examination.
- Accurate information is best obtained via a specific pattern performed on a properly restrained animal that is calm. Figures 1 and 2 outline a number pattern to follow while performing a small ruminant physical examination. Begin at number 1 and continue sequentially until information from all of the numbered sites has been obtained.

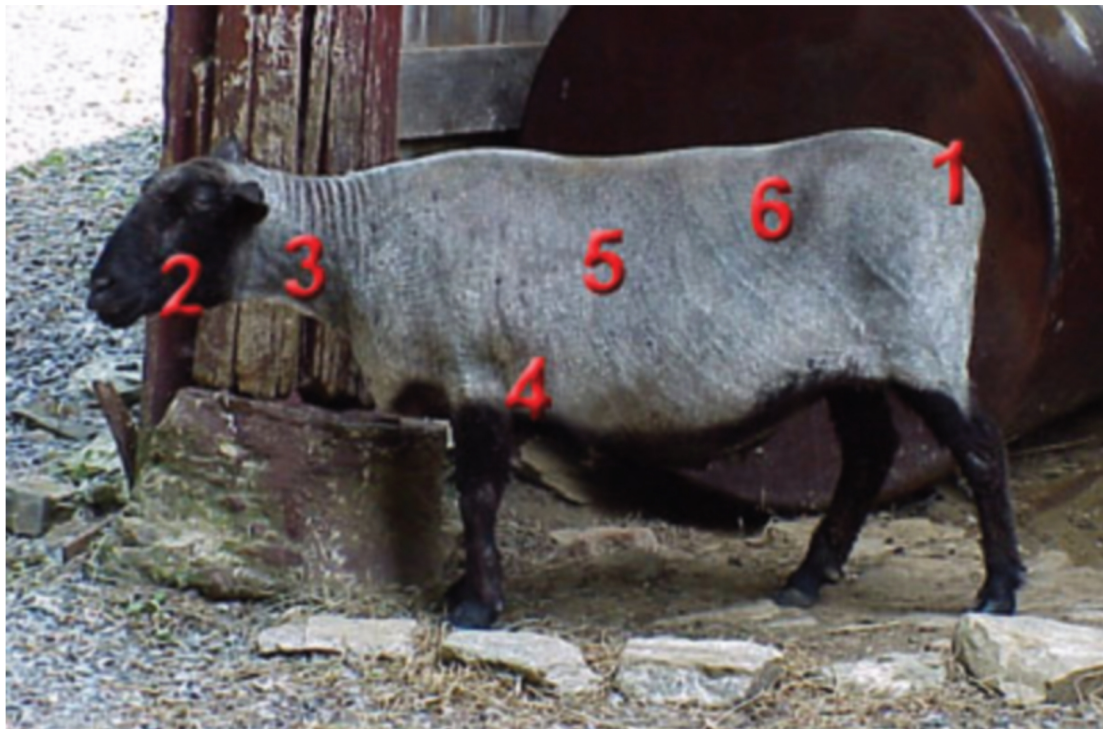


Figure 1: *Left side*

Number 1: Rectal Temperature

- Normal range from 101.5–104°F, and can be as high as 104.5°F in fully fleeced animals on hot days.
- Neonates suffering from hypothermia/hypoglycemia will often have a rectal temperature below 90°F.
- Temperatures can be compared to normal flock or herd-mates to determine environmental impact.

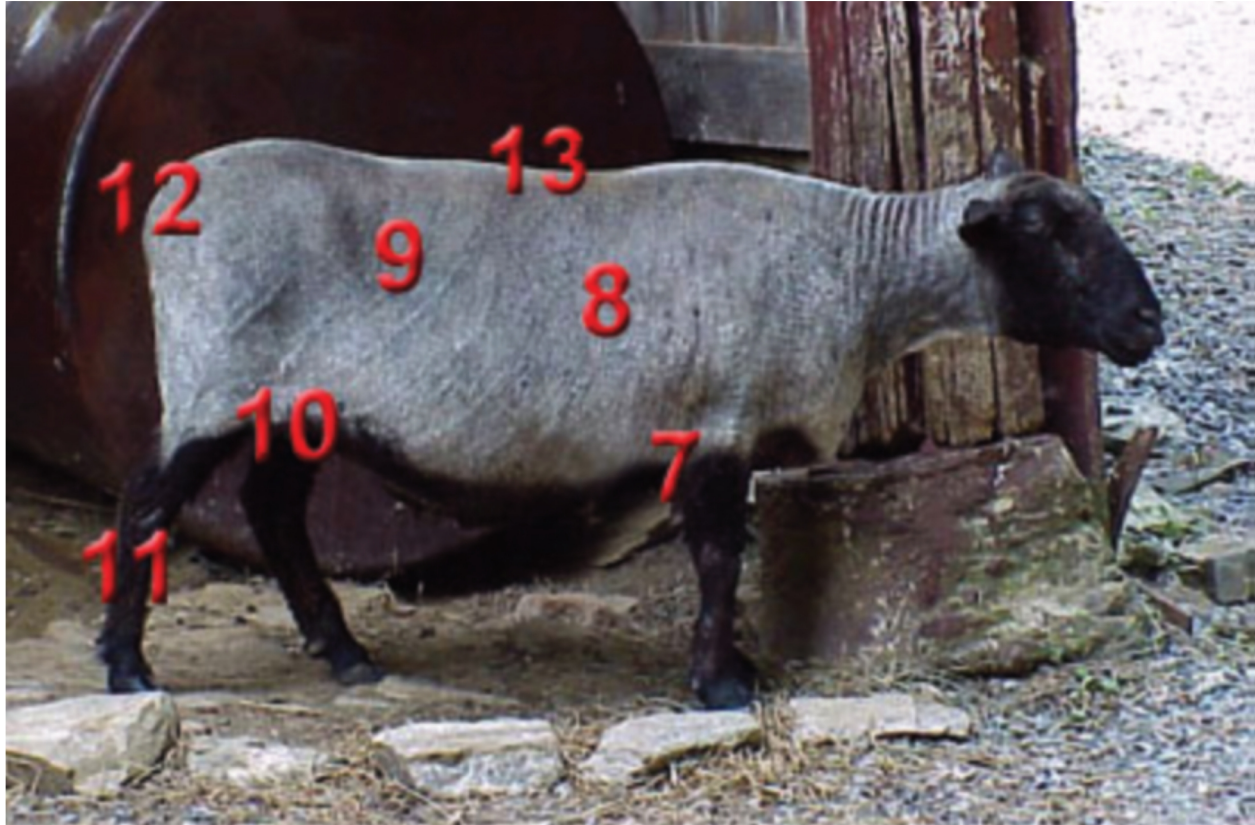


Figure 2: Right side

Number 2: Examination of the Head

- Mucous membrane color can be assessed from the conjunctiva, gums, or vulva. In animals with pigmented oral mucosa, the bulbar or palpebral conjunctiva is often superior. Applying pressure to the dorsal globe to expose the third eyelid allows for good visualization.
- Pale to white coloration is suggestive of anemia which in small ruminants is often compatible with haemonchosis. A yellow to light brown color is suggestive of hemolysis which can occur in sheep with copper toxicosis or other toxicities. Large, congested vessels in the bulbar conjunctiva can indicate toxemia.
- Ulcerative or proliferative lesions of the gums, lips, or skin near the mucous membrane junction is often associated with contagious ecthyma (orf) or bluetongue virus infection
- The eyes are normally centrally positioned in the orbit with a strong pupillary light reflex and menace response. The lids should be examined for symmetry, position, and size. The bulbar and palpebral conjunctiva should be evaluated for color and secretions. The lack of a menace response with an intact pupillary light reflex is common with polioencephalomalacia, and is often accompanied by characteristic dorsomedial strabismus of the eye. The presence of a watery or

mucopurulent ocular discharge may indicate conjunctivitis, which could be due to trauma or infection.

- Asymmetry of the face, with flaccid paralysis of the ear, eyelid, muzzle, cheek, and/or nostrils on one side of the head represents unilateral cranial nerve damage. When combined with excessive drooling and/or tongue protrusion, listeriosis is suspected. Trauma can also cause various degrees of asymmetry.
- It is normal for small ruminants to have a bilateral clear-to-serous nasal discharge. Animals suffering from respiratory disease may have a mucopurulent discharge or a buildup of crusty material due to failure to clean their nose. In sheep, a unilateral discharge could indicate infection with *Oestrus ovis* (nasal bot). In camelids, munge can be a common herd problem.
- Abscesses, salivary gland mucocèles, or impacted cud can produce swelling in the cheek area. A firm swelling involving the mandible can indicate actinobacillosis in sheep.
- Teeth should be thoroughly evaluated with a good oral examination, which may require a gag and light source for the posterior oral cavity. Fighting teeth may need removal or trimming in camelids. Broken and worn teeth are commonly seen in older, thin ewes (broken mouth).
- Severe gastrointestinal parasitism may cause an accumulation of fluid in the submandibular space (“bottle jaw”) as well as pale mucous membranes.
- Caseous lymphadenitis caused by *Corynebacterium pseudotuberculosis* often infects lymph nodes and produces focal, firm, round nodules caudal to the ramus of the mandible or ventral to the mandible.
- Breath can smell foul with necrotic stomatitis, pharyngitis, or pneumonia; acetone odor or a chemical smell to the breath is typical of ketoacidosis (ketosis), which is associated with pregnancy toxemia in sheep. The presence of a rumen smell to the breath or visualization of vomitus at the mouth is often associated with toxic plant ingestion. Rhododendrons and azaleas are common plants in the U.S. and ingestion of these plants by small ruminants causes vomiting as a prominent clinical sign.

Number 3: Examination of the Neck

- Abnormalities such as goiter or abscesses can produce swellings of the neck.
- Also, the thymus gland appears as a soft, distinct swelling in the upper neck region of young goats.
- Non-painful, round, fluctuant swellings that form at the base of a wattle are cysts. They are benign and can be surgically removed.
- Large, round, firm swellings in the upper neck and along the jugular furrow may indicate lymph node abscessation, most commonly associated with caseous lymphadenitis.

Number 4: Examination of the Heart

- Normal heart rate is 70 to 90 beats/minute. The heart is easily auscultated on the left side over the 4th to 5th intercostal spaces. The heart rate is most likely to elevate during times of stress, excitement, pain, and toxemia.
- Congenital heart disease, endocarditis, or intrathoracic masses such as abscesses or thymomas can result in murmurs. Anemia can also cause cardiac murmurs associated with reduced blood viscosity.
- Muffled heart sounds are also associated with intrathoracic masses and pericardial effusion. Congestive heart failure is very rare in the small ruminant.

Number 5: Examination of the Lungs

- Normal respiration rate is 12 to 20 breaths/minute, and can elevate to as high as 60 breaths/minute on hot days. Respiratory rate and effort should be determined at rest and after exertion when signs of lower respiratory tract disease (coughing and open-mouth breathing) may become evident.
- Auscultation of the lungs of small ruminants is difficult due to their small lung field and normally harsh bronchovesicular sounds. It is important to listen cranially and ventrally to the lungs because involvement of this region with lower respiratory disease is common.
- Short, shallow breathing is often overlooked but may indicate pleural pain, even in the presence of normal lung sounds.
- Tracheal palpation that elicits a cough may indicate tracheitis, bronchitis, or a combination of the two.
- Other diagnostic procedures including thoracic radiography, ultrasonography and transtracheal wash are easily performed in the small ruminant.
- Elevated rectal temperature, high respiratory rate, nasal discharge, and the presence of a cough often accompany respiratory disease.

Number 6: Examination of the left abdomen.

- The normal rate of rumen contraction is 1 to 2 contractions/minute, which can be auscultated over the left paralumbar area. It is important to also determine the strength of contraction during auscultation. A strong, healthy contraction will push outward against the hand when ausculting.
- Ballotment of the normal rumen will reveal a soft, gas-filled indentible area dorsally with a more firm, ingesta-filled doughy area ventrally.
- Small ruminants spend several hours a day ruminating (chewing cud).
- A distended abdomen may indicate bloat, advanced pregnancy, or peritonitis, but some breeds such as the pygmy goat always appear very round
- Evaluate the hair or wool near the perineum for fecal material, which could indicate a digestive disturbance such as diarrhea.

Number 7: Examination of the Heart (Right Side)

- The heart should be auscultated on the right side over the 4th to 5th intercostal spaces as described above in number 4.

Number 8: Examination of the Lungs (Right Side)

- The lungs should be auscultated on the right side as described above in number 5.

Number 9: Examination of the right abdomen

- Auscultation of the right abdomen is mainly done in neonates to assess borborygmi (gut sounds).
- The absence of gut sounds in an anorexic animal with a distended abdomen warrants further diagnostics.

Number 10: Examination of the Udder or Testes

- Udder
 - Visual examination should note shape, color, symmetry, and contour. Blue discoloration is often indicative of gangrenous mastitis due to *Staphylococcus aureus*. Red discoloration is often indicative of toxic mastitis due to coliform bacteria or trauma. These diseases of the mammary gland also cause swelling and therefore create asymmetry.
 - Manual examination should note firmness, tenderness, and fibrosis. Most cases of

- mastitis will produce these findings. However, in sheep, a diffusely firm udder with minimal milk secretion and no pain noted immediately after lambing could be due to ovine progressive pneumonia (OPP). In goats, a similar finding of the udder may be due to caprine arthritis-encephalitis (CAE). Camelids rarely have udder difficulties.
- Milk examination using a strip plate should note discoloration, consistency, and the presence of clots or clumps. The use of the California mastitis test (CMT) will help identify animals with subclinical mastitis. Small ruminants normally have higher cellular contents in their milk secretions than cattle; therefore, careful interpretation of this test is necessary. A trace to plus 1 is considered normal. A milk culture is indicated when mastitis is identified.
 - Ulcerated lesions with scabs may be seen near the teat orifice in animals suffering from contagious ecthyma (orf).
 - An enlarged mammary gland in a non-lactating small ruminant is known as a precocious udder and can be considered common in high-producing small ruminants.
 - Male goats (bucks) may have over-developed mammary glands. This abnormality is referred to a gynecomastia.
 - Testes
 - A breeding soundness exam (BSE) should be performed on all rams or bucks that will be used for breeding stock.
 - The testes and epididymus should be palpated, taking note of size, shape, freedom of movement, and consistency. An abnormal size and shape could indicate epididymitis, orchitis, or hypoplasia. A lack of movement within the scrotum could indicate adhesions and a soft consistency to the testes could indicate poor sperm production.

Number 11: Examination of the Feet and Legs

- Care must be taken to differentiate primary musculoskeletal problems from secondary problems that include neurologic, metabolic, or infectious disease. Small ruminants with pain associated with a mammary gland infection may present as lame due to limb contact with the enlarged gland. Also, excited animals may appear sound, so care should be taken as to when the animals are examined.
Overgrown toes, a common problem in small ruminants, are easily corrected by regular trimming. Camelid feet are normally trimmed only at the toe. Foot rot in camelids is rare. However, foreign body punctures are not uncommon, depending on the environment.
- Interdigital infection with *Dichelobacter nodosus* causes a characteristic foul odor and symmetrical swelling that may lead to severe necrosis and underrunning of the hoof horn 'foot rot'. These animals are very painful and because multiple feet are involved, they are often seen walking on their knees.
- Hoof testers can be used to identify foot abscesses. Affected animals are typically lame in only one foot.
- Joints should be palpated for swelling, pain, and decreased range of motion, which is indicative of septic arthritis. Septic joints are generally very painful.
- In goats, enlarged, painful joints, specifically the carpal joints, are indicative of caprine arthritis-encephalitis (CAE).
- Lambs and kids that have stiff limbs and are unwilling to rise and walk may be suffering from white muscle disease (nutritional myodegeneration).
- Injury to the spinal cord via trauma or parasitic migration of *Parelaphostrongylus tenuis* will result in paresis or paralysis.

Number 12: Examination of Urogenital Tract

- Occluding the nostrils for a brief period of time induces urination in sheep. This should

not be performed in an extremely ill animal. In goats, there is no specific trick to induce urination. However, most small ruminates will urinate at some point during physical examination so a container should be kept in close proximity.

- The presence of ketone bodies in the urine is indicative of a negative energy balance seen in sheep with pregnancy toxemia.
- Straining to urinate with vocalization is commonly seen in male small ruminants suffering from obstructive urolithiasis.

Number 13: Examination of the Integument

- Initially observe the patient from a distance to get an impression of skin, hair, or wool abnormalities and their distribution. Next, examine the coat for alopecia or color change. The skin should also be examined for color, elasticity, and lesions.
- Ectoparasites such as biting and sucking lice are common in small ruminants and their presence may result in pruritus with skin excoriation.
- Goats with demodectic mange present with nodules that exude a thick, white material. These nodules are typically present over the neck and back.
- Patches of loose or missing wool in sheep, known as “wool break,” are often associated with systemic illness or nutritional stress.
- Camelid dermatology mostly involves the face and legs. Munge and zinc deficiencies are not uncommon.



MISCELLANEOUS

ASSOCIATED CONDITIONS

N/A

AGE-RELATED FACTORS

N/A

ZOONOTIC POTENTIAL

N/A

PREGNANCY

See above

BIOSECURITY

N/A

PRODUCTION MANAGEMENT

N/A

SYNONYMS

N/A

SEE ALSO

- Body Condition Scoring: Cervidae (www.fiveminutevet.com/ruminant)
- Body Condition Scoring: Dairy Cattle (www.fiveminutevet.com/ruminant)
- Body Condition Scoring: Goats (www.fiveminutevet.com/ruminant)
- Body Condition Scoring: Sheet (www.fiveminutevet.com/ruminant)
- Caprine Arthritis Encephalitis Virus
- Maedi-Visna (Ovine Progressive Pneumonia)
- Specific disease chapters

ABBREVIATIONS

- CAE = caprine arthritis-encephalitis
- CMT = California mastitis test
- BCS = body condition score
- BSE = breeding soundness exam
- OPP = ovine progressive pneumonia

Suggested Reading

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