

Clinical signs of scrapie

Clinical signs vary tremendously between cases of scrapie, and there are no signs that are a definite indication of the disease. There is often a general change in temperament or behaviour in the weeks before more specific signs develop. In some cases, an affected animal's condition may worsen rapidly or it may be found dead. An adult animal may show changes in general behaviour such as aggression or apprehension, tremors, incoordination, or abnormal gait. However, a mature thin animal with a poor coat may also be diagnosed with the disease. Animals with scrapie can show a combination of the following signs:

Changes in behaviour:

- become excitable
- have drooping ears
- show increased nervousness or fear
- lag behind
- apprehension
- aggression
- depression or have a vacant stare
- excessive licking

Skin irritation:

- repeated rubbing of the head and body against objects such as fences, posts, or haystacks;
- repeated scratching of the flanks. Horned animals may scratch with their horns;
- nibbling or grinding teeth when rubbing themselves or when rubbed firmly on the back;
- continued scratching of the shoulder or ear with a hind foot. Unusual or agitated nibbling of the feet, legs, or other parts of the body; and
- excessive wool or hair loss or damage to the skin.

Changes in posture and movement:

- trembling (mainly of the head)
- unusual high-stepping trot in early stages
- severe incoordination
- stumbling
- standing awkwardly
- weak hind leg
- unable to stand

Later clinical signs:

- weight loss, despite a good appetite
- death

Reference: Canadian Food Inspection Agency.

Clinical Examination Protocol to Detect Atypical and Classical Scrapie in Sheep

1. Assessment of Posture

1. Assess the posture of the animal whilst undisturbed.
2. Animals affected by TSEs may stand with wide-based limbs, may appear hunched, or may stand with a low head carriage.

2. Assessment of Behavior

1. Study the animal's behavior, when left alone, when approached, and when handled.
2. TSE-affected animals may display altered mentation by standing separately from other sheep or not immediately following other sheep.
3. When the animal is approached, it may run away and collapses, or it collapses to the floor when handled. Compulsive clockwise or counter-clockwise circling may be seen in sheep with atypical scrapie.

3. Menace Response Testing

1. Hold the animal's head for testing of the menace response: move the hand or several fingers several times towards each eye of the animal to induce a blink response but be careful not to touch any facial hairs or create any air turbulence that may cause the animal to blink.
2. The menace response may be **absent** in scrapie-affected animals, particularly in sheep with atypical scrapie. Although testing of the menace response is the only cranial nerve testing used as part of the protocol, visual inspection of the face during this procedure may reveal other signs of neurologic deficits not normally seen in scrapie, *e.g.* facial paralysis. If the animal does not blink in response to the menace it is advisable to test the palpebral reflex by touching the eyelids to ensure that the animal's inability to blink is not caused by facial paralysis.

4. Testing of the Scratch Response

1. Ensure the animal is calm during this procedure because the test cannot be interpreted in a struggling animal.
2. Scratch areas of the back at the thoracic, lumbar, and sacral regions, pausing between each scratching episode.
3. If the animal responds with **rhythmical head or body movements, or moves or licks its lips upon scratching** of one particular area, repeat the scratch test to confirm reproducibility of the scratch response.
4. A repeatable response is usually elicited in animals that are pruritic, which usually includes sheep with classical scrapie or goats with the pruritic form of scrapie, but there is generally no response in sheep with atypical scrapie unless other pruritic skin conditions or ectoparasites are present.

5. Checking for Wool Loss and Skin Lesions

1. Inspect the skin.
2. Pruritus due to scrapie usually causes hair loss, which may be on the poll, back, rump, side of chest or abdomen due to excessive rubbing or scratching where the underlying skin appears normal.
3. Abrasions may appear later if the animal has the opportunity to rub on sharp objects. Bite wounds may appear, particularly on the limbs, due to excessive nibbling of the limbs.

6. Scoring Body Condition

1. Assess the animal's body condition by palpating the dorsal and transverse processes of the lumbar vertebrae.
2. Scrapie may cause a progressive loss of body condition where the transverse processes of the lumbar vertebrae can be easily felt individually, and the ends of the processes appear sharp.

7. Blindfolding the Animal

1. Cover the animal's eyes with a hood, which can be made by using any nonsee-through bag where one corner is cut off to allow breathing of the animal.
2. Release the animal only if there are no safety concerns, and there is no risk of injury due to a panicking animal; otherwise keep hold of the sheep and study animal movements whilst still in control of the animal.
3. Blindfolding may **exacerbate** signs of a vestibular system or cerebellar dysfunction, which may be obscured by the animal's ability to compensate through its vision. Loss of balance, incoordination, or circling may be elicited, particularly in otherwise clinically unremarkable sheep with atypical scrapie.

8. Assessment of the Animal's Movement

1. Study the animal's gait and muscle movements when it moves freely.
2. Incoordination may be characterized by wide-based movements of the hind limbs, hopping with both hind limbs, or swaying excessively in the hind quarters, which may result in stumbling or briefly sitting down.
3. The presence of a **head tremor** is often subtle when the animal is undisturbed but may become more noticeable during or after completion of the clinical examination.

9. Interpretation

1. Consider the significance of the findings with respect to scrapie.
2. Although the presence of individual signs, such as a repeatable response to scratching, tremor, abnormal behavior, circling, collapsing episodes, ataxia, or an absent menace response, may have various causes, the combined occurrence of two or more of these signs is highly suggestive of scrapie in sheep or goats.

Reference: Konold, T., & Phelan, L. (2014). Clinical Examination Protocol to Detect Atypical and Classical Scrapie in Sheep. *Journal of Visualized Experiments*.