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Clinical examination of sheep☆

F.M. Lovatt

Castle Veterinary Surgeons, Montalbo Road, Barnard Castle, Co Durham, DL12 8ED England, United Kingdom

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ABSTRACT

Clinical examination of sheep involves the interpretation of information about both the individual and the flock within the context of the farm environment. It is an art, which relies on careful observation and the systematic collection of specific data, suggestions of which are presented in tabular format. However, interpretation is subjective with the potential for wide variation between clinicians. To ensure that the information is directly transferable, clinicians have a responsibility to use repeatable measurements and assessments wherever possible. Standard scoring systems and criteria that have been developed primarily for use in the research environment are reviewed and their relevance to the clinician is discussed. In particular, the repeatability of measures is considered.

1. Introduction

Clinical examination of sheep is the basic foundation upon which the clinician must build an investigation of disease or sub-optimal performance. There has previously been much published on this subject (Sherman and Robinson, 1983; Radostits et al., 1994; Hindson and Winter, 1995; Clarkson and Winter, 1997; Jackson and Cockcroft, 2002; West et al., 2002; Jackson, 2006); these mainly consist of opinionated reviews and recommendations based on the authors' personal experience in clinical practice. This article aims to consider recent research and to quantify the clinical examination by highlighting specific scoring systems that have been established. It will consider the repeatability of commonly used measures.

The use of standard scoring systems with high repeatability ensures that the information gained from the clinical examination is directly transferable and this has obvious benefits in terms of flock health planning or disease surveillance, especially where computer based systems are used (Ganter, 2008; Hosie et al., 2009) or in legal disputes. However, despite emphasising standard systems and criteria, there is no implied suggestion that these are sufficient in isolation. There can be no substitute for a detailed systematic examination (Tables 1–3) by an experienced clinician, who has developed the art of interpreting the range of clinical signs displayed by sheep.

In studies comparing *ante-mortem* clinical diagnosis with post-mortem findings in dogs, which either had died or were euthanised, there was total disagreement in up to 40% of cases (Kent et al., 2004; Vos et al., 2005). It would not be unreasonable to expect an increased number of discrepancies in cases of individual sick sheep. This is perhaps most relevant in the context of pedigree flocks with high value individual sheep; however, sheep clinicians are usually considering a flock problem and, early in the investigation, post-mortem examinations can be undertaken and often be of great value.

When considered in the context of sheep flock health management, the detailed physical examination of the individual sheep is essential and highly relevant. However, it must not distract the clinician from essential considerations, such as the epidemiology, the gathering of a detailed history, and an examination of both the environment and

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E-mail address: pfmlovatt@metronet.co.uk.

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Table 1
Information that should be included in the specific case history in sheep flocks.

Signalment	How many animals in the various groups? Breed? Age? Reproductive status?
Nutrition	Access to grazing? What ration? What forage? How is this fed? Trough space per sheep? Any recent changes?
Water	What is available? Do the sheep consume it? Where does it come from?
Environment	Are the sheep grazing? Size and topography of pasture? Housed? What flooring/bedding? What is the stocking rate? Recent weather conditions?
Preventive measures	What is the health status of sheep? Prophylactic measures? Routine treatments? Vaccinations? Details of timings, dosages and methods of administration.
Recent stresses	Any recent transportation or visits to sales or shows? Recent gathering for management or husbandry procedures? Any mixing with 'foreign' sheep?

Table 2
Summary of considerations by the clinician during inspection of an individual sheep from a distance.

Behaviour	Is there a difference from the rest of the group? Bright/alert/dull/apathetic/anxious/restless/excitable/manic?
Posture	Consider carriage, position and symmetry of head, body and limbs. Restricted movement/back arched/elbows abducted/head-pressing? Recumbent – sternal/lateral/opisthotonus?
Gait	Circling/wandering/wide-based stance/ataxic/hypometria/hypermetria? Lame? How severe? Which leg? Lameness score.
Feeding	Eating what is offered? Has food been left? Loss of appetite or ability to eat? Consider prehension/mastication/swallowing. Consider rumination/eructation. Bloat? Cud-dropping?
Defaecation	Diarrhoea? Constipation? Tenesmus? Faecal staining of breach, legs, belly? Volume/frequency/character of faeces.
Respiration	Rate; allow for increase due to exertion, heat, stress. Rhythm – three phases (inspiration, expiration, pause) of equal length or abnormal? Depth – increased (hyperpnoea) or shallow? Dyspnoea (dilatation of nostrils, head extended, mouth open, abduction of elbows, grunting noise)? Coughing? Sneezing? Grunting? Wheezing? Roaring?
Skin/fleece	Fleece loss localised/generalised? Pruritus?
Head	Eyes – blinking/blepharospasm/discharge? Nasal discharge? Ears drooping? Mouth dribbling?

the flock. The condition under investigation may not result in individuals that are clinically ill, but may involve a group of animals that are not reaching target performance. In this situation, it is only helpful to examine abnormal individuals if they clearly represent the whole group, though such selection is, by definition, subjective.

2. Specific history

Most clinical examinations begin with a complaint from the owner or shepherd and subsequently much of the

Table 3
Summary of issues to be addressed by the clinician in a detailed clinical examination of an individual sheep (Sherman and Robinson, 1983; Clarkson and Winter, 1997; Jackson and Cockcroft, 2002).

General	Body condition score – Scale 1–5. Temperature, pulse (strong/weak/rapid), respiration.
Mucous membranes	Assessed at eye, oral mucosa or vulval mucosa. FAMACHA© scale. Salmon – pink/pale/icteric/hyperaemic/cyanotic? Capillary refill time – assess at gum or vulval lips <2 s.
Lymph nodes	Check submandibular, parotid, retropharyngeal, prescapular, precrural, popliteal and supramammary. Palpable/symmetrical/enlarged/discharging?
Skin/fleece	Fleece present/lumpy/matted/stained/wool break? Panniculus reflex. Wounds/skin lesions/pruritus/irritation? Nibble reflex. Maggots, lice, keds, ticks, sheep scab lesions? Score alopecia, hypersensitivity and level of scab infestation. NB normal greasy staining of skin/wool due to sebaceous glands: infraorbital, interdigital and inguinal.
Head	Symmetry/swellings/oedema – generalised/submandibular? Skin lesions – erythematous/crusty/moist/dry/flaky/pustular? Nares – symmetrical? Discharge – unilateral or bilateral/character?
Ears	Record tags. Symmetrical/swelling/skin lesions/discharge/mites?
Eyes	Menace response. Pupillary light reflex. Pupil size and symmetry. Nystagmus/strabismus? Consider application of topical local anaesthetic. Epiphora/discharge/blepharospasm/conjunctivitis/keratitis/corneal opacity/peripheral neovasculation/ulceration? Sclera – vessels injected/jaundice? Internal examination with ophthalmoscope.
Mouth	Oral lesions – vesicular/ulceration/pustular/scabs/odour? Incisors – deciduous/permanent/number (age)/apposition? Premolars/molars – palpate through cheek or inspect with gag and torch. Mandibular swellings/pain/irregularities/sharp edges/food impaction/teeth missing/discharging sinuses/drooling/dysphagia/odour?
Neck	Inspection of pharynx and larynx with laryngoscope and gag or endoscope. Swellings/injury/stridor/dysphagia/odour? Blood samples from jugular vein.
Thorax	Auscultation of heart at 4th to 5th intercostal space on both sides. Auscultation and ultrasonography of lungs. Wheelbarrow test.
Abdomen	Assess size, shape, consistency. Ballottement? Auscultation of rumen over left paralumber fossa – 1–2 primary and 1 secondary contraction per min. Auscultation of abomasums and intestines. Ultrasonography. Faeces – volume/character? Faecal sample. Urine – frequency/volume. Urine sample.
Limbs	Injuries/muscle wasting/paresis/paralysis/skin sensation/muscle tone? Consider proprioception and reflexes – triceps/patellar/pedal. Palpation of all joints. Pain/stiffness/swelling/temperature? Feet – coronary band/interdigital space/hoof wall/sole/white line. Growth/odour/lesions/under-running?
Male genitalia	Prepuce – swelling/obstruction/pain/crystals? Penis – free-movement/swelling/pain/colour/external lesions? Urethral process – free/patent? Scrotum, testes and epididymides – symmetry/consistency/pain/free-movement/vasectomy scars? Measure circumference. Semen sample.
Female genitalia	Vulva – discharge/swelling/odour/prolapse/injury/bruising? Normal lochia for 1–3 weeks.
Udder	Swelling/colour/pain/symmetry/skin temperature/skin lesions/patency of teat canal? Character of milk/secretions? Sample milk.