

PN-ACM-277

Diseases of Economic Importance in Small Ruminants in sub- Saharan Africa

ILRI Slide Series 3

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ISBN 92-9146-052-4

Correct citation: Ibrahim H., Tembely S. and Roger F. 1999. *Diseases of Economic Importance in Small Ruminants in sub-Saharan Africa*. ILRI Slide Series 3. ILRI (International Livestock Research Institute), Nairobi, Kenya. 44 pp.

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Preface

Diseases of small ruminants affect the incomes of smallholder farmers in sub-Saharan Africa by reducing productivity or through loss of the animal. This slide series aims at making available to animal scientists in national agricultural research systems (NARS) a collection of slides and accompanying text that will help identify symptoms of the diseases. This series is divided into two parts. The symptoms of the diseases are covered in part A while post-mortem examination is covered in part B. The two parts complement each other. In most cases the symptoms of a disease can only be identified through examining the internal organs of a dead animal. In the absence of a veterinarian, it is important that livestock scientists perform post-mortem examinations when animals die on their research farms to ascertain the cause before an epidemic breaks out.

This series is directed at young animal scientists with BSc or MSc degrees. It can also serve senior animal scientists by providing slides for seminars or lectures in educational institutions. The series is made up of slides and a booklet that contains pictures and text.

I would like to acknowledge the assistance of the manager of Addis Ababa Abattoir for allowing ILRI to photograph diseased organs of sheep and goats. I am also grateful to the management and staff of the ILRI Research Station at Debre Birhan, Ethiopia. I acknowledge Woizero Menbere W/Giorgis for the photographic work. I acknowledge Ms Anne Marie Nyamu for editing the text of the booklet and the staff in the ILRI Publications Section for design, layout and printing.

Habib Ibrahim
Training Materials Specialist

Part A: Diagnosis of diseases

This is a slide set on 'Diseases of Economic Importance in Small Ruminants in sub-Saharan Africa' which is part of a series produced by the International Livestock Research Institute (ILRI).

Diseases of small ruminants cause economic losses to smallholder farmers. These diseases must be identified correctly so farmers can take proper control measures. This slide series will enable you to:

- identify small ruminant diseases of economic importance in sub-Saharan Africa
- conduct post-mortem examinations
- dispose of carcasses.

1. **Disease:** Contagious caprine pleuropneumonia (CCPP)
Small ruminant: Goat
Location: Debre Zeit, Ethiopia
Year: 1996
Symptoms: Abundant and purulent nasal discharge

2. **Disease:** Contagious caprine pleuropneumonia (CCPP)
Small ruminant: Goat
Location: National Veterinary Institute, Debre Zeit, Ethiopia
Year: 1996
Symptoms: Artificially infected goat showing purulent nasal discharge

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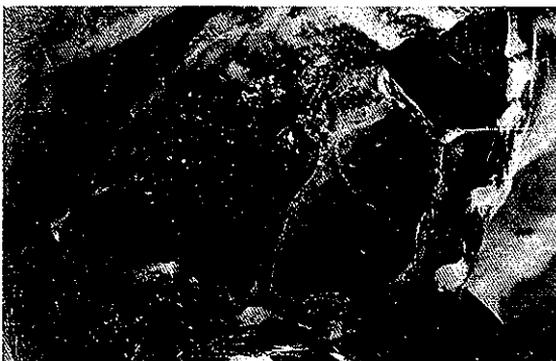
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3. **Disease:** Contagious caprine pleuropneumonia (CCPP)
Small ruminant: Goat
Location: Yabello (Borana), Ethiopia
Year: 1995
Symptoms: Straw-coloured thoracic fluid (drawn in the pipette)

4. **Disease:** Contagious caprine pleuropneumonia (CCPP)
Small ruminant: Goat
Location: National Veterinary Institute, Debre Zeit, Ethiopia
Year: 1995
Symptoms: Straw-coloured thoracic fluid (in the test tube) taken from artificially infected goat

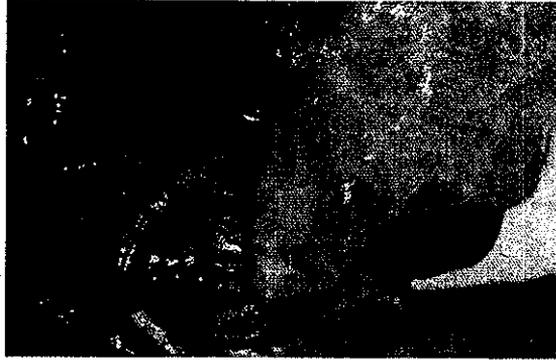
5. **Disease:** Contagious caprine pleuropneumonia (CCPP)
Small ruminant: Goat
Location: Yabello (Borana), Ethiopia
Year: 1995
Symptoms: Pleuritic adhesions (chronic case). Parts of the lungs stick to the thoracic cavity

6. **Disease:** Contagious caprine pleuropneumonia (CCPP)
Small ruminant: Goat
Location: Debre Zeit, Ethiopia
Year: 1995
Symptoms: Artificially infected goat showing omelette of fibrine on the lung (yellow mass on the right)

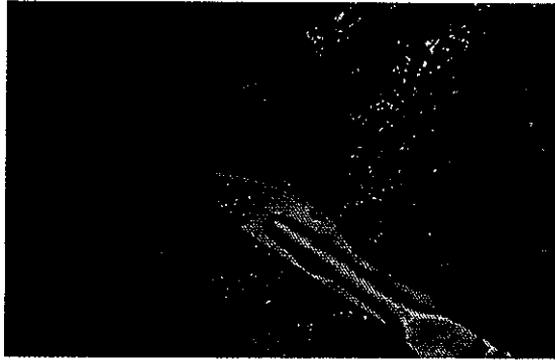
7. **Disease:** Contagious caprine pleuropneumonia (CCPP)
Small ruminant: Goat
Location: National Veterinary Institute, Debre Zeit, Ethiopia
Year: 1996
Symptoms: Lung hepatisation in an artificially infected goat. Section: granular spot, wine-coloured

8. **Disease:** Peste des petits ruminants (PPR)
Small ruminant: Sheep
Location: National Veterinary Institute, Debre Zeit, Ethiopia
Year: 1995
Symptoms: Peracute case; depressed animal; haemorrhagic diarrhoea

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9. **Disease:** Peste des petits ruminants (PPR)
Small ruminant: Goat
Location: Shoa Robit (North Shoa),
Ethiopia
Year: 1995
Symptoms: Hemorrhagic diarrhoea

10. **Disease:** Peste des petits ruminants (PPR)
Small ruminant: Goat
Location: Shoa Robit (North Shoa),
Ethiopia
Year: 1995
Symptoms: White necrotic spots on the
tongue

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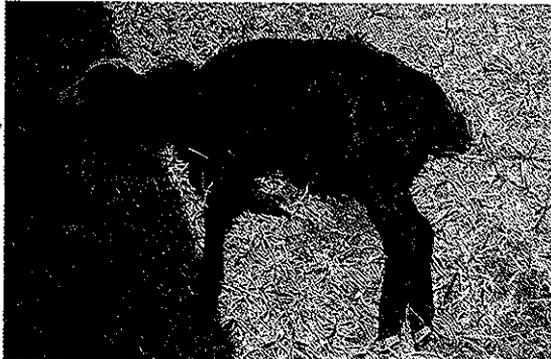
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13. **Disease:** Liver fluke
Small ruminant: Sheep
Location: Addis Ababa Abattoir, Addis Ababa, Ethiopia
Year: 1997
Symptoms: Enlarged gall bladder (note the liver fluke extracted from the bile duct shown on the outside)
14. **Disease:** Liver fluke
Small ruminant: Sheep
Location: Addis Ababa Abattoir, Addis Ababa, Ethiopia
Year: 1997
Symptoms: Liver flukes extracted from an infected liver
15. **Disease:** Haemonchosis
Small ruminant: Sheep
Location: ILRI Debre Birhan Research Station, Debre Birhan, Ethiopia
Year: 1997
Symptoms: A 3-month-old lamb artificially infected with *Haemonchus contortus* (a blood sucking parasite in sheep) showing weakness and emaciation

16. **Disease:** Haemonchosis
Small ruminant: Sheep
Location: ILRI Debre Birhan Research Station, Debre Birhan, Ethiopia
Year: 1997
Symptoms: Open abomasum showing *Haemonchus contortus*
17. **Disease:** Pneumonia
Small ruminant: Sheep
Location: ILRI Debre Birhan Research Station, Debre Birhan, Ethiopia
Year: 1997
Symptoms: Pneumonia pleuritic adhesions (note lung sticking to chest wall)
18. **Disease:** Pneumonia
Small ruminant: Sheep
Location: ILRI Debre Birhan Research Station, Debre Birhan, Ethiopia
Year: 1997
Symptoms: Diseased lung showing area of consolidation (hard when touched)

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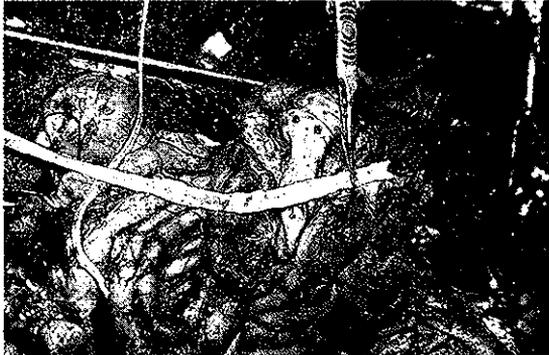
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19. **Disease:** Pneumonia
Small ruminant: Sheep
Location: ILRI Debre Birhan Research Station, Debre Birhan, Ethiopia
Year: 1997
Symptoms: Lung with hepatisation (hard and looks like liver in structure)

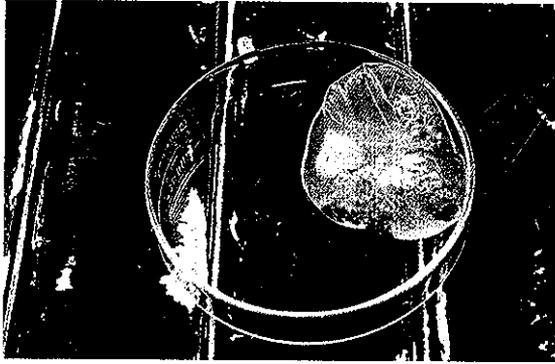
20. **Disease:** Pneumonia
Small ruminant: Sheep
Location: ILRI Debre Birhan Research Station, Debre Birhan, Ethiopia
Year: 1997
Symptoms: Normal lung on the left, diseased lung on the right; size and colour of the two lungs are different; diseased lung is congested

21. **Disease:** Tapeworm (*Moniezia expansa*)
Small ruminant: Sheep
Location: ILRI Debre Birhan Research Station, Debre Birhan, Ethiopia
Year: 1997
Symptoms: Tapeworm in the small intestine

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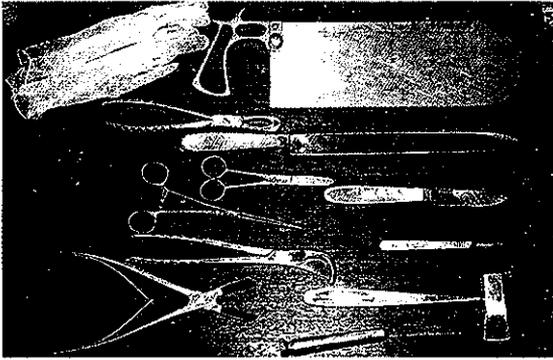
22. **Disease:** Rumen flukes (*Paramphistoma* spp)
Small ruminant: Sheep
Location: ILRI Debre Birhan Research Station, Debre Birhan, Ethiopia
Year: 1997
Symptoms: Rumen showing adult rumen flukes attached to the wall (red in colour)
23. **Disease:** Gid (coenurosis, staggers, sturdy)
Small ruminant: Sheep
Location: ILRI Debre Birhan Research Station, Debre Birhan, Ethiopia
Year: 1997
Symptoms: Cystic larva (*Coenurus cerebralis*), the intermediate stage of the adult dog parasite *Taenia multiceps*

Part B: Post-mortem examination

We have learned the symptoms of diseases of small ruminants in part A. As we have seen, many of these symptoms are visible in internal organs. Animals die and it is important to know the cause. Knowing this information helps us to protect other animals. When you need to diagnose the cause of death of an animal, seek the assistance of a veterinarian. A simple post-mortem examination is helpful to determine the possible cause of the death. If you cannot find a veterinarian, you may perform the post-mortem examination yourself. It is safe to perform post-mortem examinations in the field but take care not to contaminate the area surrounding the post-mortem site. In case of obvious diseases that can be transmitted from animals to humans, such as anthrax, the carcass should not be opened under any circumstance. The following are the steps involved in performing a post-mortem examination.

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27. Complete skinning the carcass.

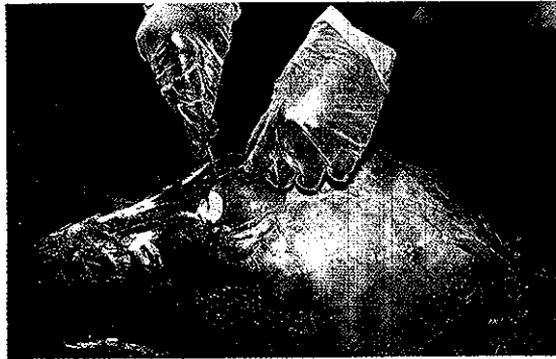
28. Open the abdominal cavity.

29. Remove abdominal muscles.

27.



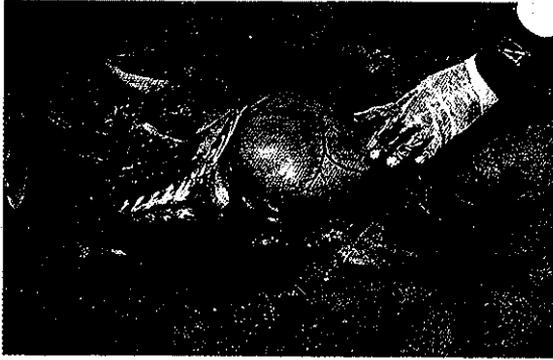
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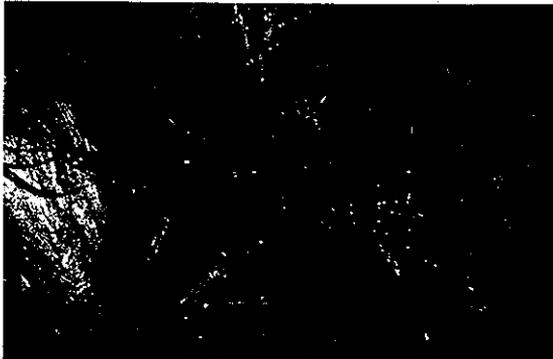
30.



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30. When you open the abdominal cavity, all of the viscera should be visible, and each part must be examined in detail.

31. Remove the organs from the abdominal cavity.

32. Examine both kidneys in the abdominal cavity.

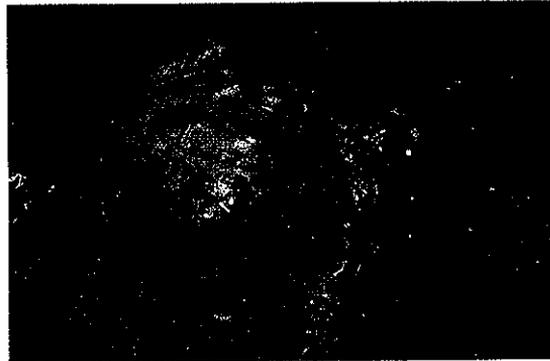
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36. Empty the rumen and look for flukes which, if present, are attached to the walls.

37. Open the abomasum and examine it for diseases.

38. Open the thoracic cavity using forceps to break the bones.

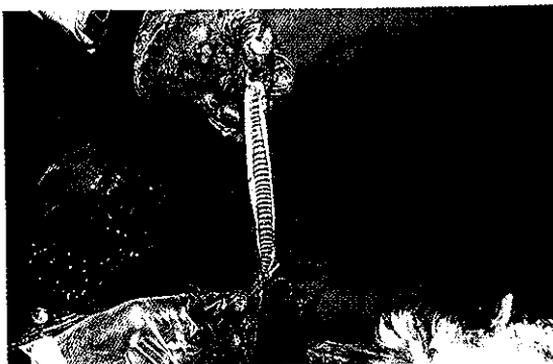
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42. After you finish the post-mortem examination, the dead animals must be destroyed because they are carriers. Bury or burn the wastes of these diseased animals (bedding, manure, contaminated feed and water). An incinerating room would be the ideal place to perform this operation.
43. In a few cases, you may need further analysis of the carcass. In such situations you will collect samples and send them to a laboratory. Try to provide the expert in the laboratory with the history of the case, the species and number of animals involved, the number of sick and dead animals, symptoms of illness and post-mortem findings.
- When you collect specimens for toxicological examination, send liver, kidney, fat and stomach contents in separate containers.
 - When you collect specimens from animals killed by viral diseases, try to collect fresh samples and bottle them aseptically.
 - Collect blood in a suitable anticoagulant, pack on ice and forward without delay. Avoid exposure to high temperatures, disinfectants, light, freezing and drying.

- Collect fresh specimens for bacterial and fungal examination and preserve on ice. You can also preserve the specimens in 37% formalin for histopathological examination.
- Use sterile instruments to collect specimens for bacteriological and virological examination and place them in sterile containers.
- To avoid contamination, use a different set of instruments and containers for each organ.
- Collect fresh faeces specimens for parasitological examination.

Recommended reading

Hansen J. and Perry B. 1990. *The Epidemiology, Diagnosis and Control of Gastro-intestinal Parasites of Ruminants in Africa. A Handbook*. ILRAD (International Laboratory for Research on Animal Diseases), Nairobi, Kenya. 121 pp.