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TECHNICAL BULLETIN No.33

Postmortem techniques for sheep and goats

ESGPIP

ETHIOPIA SHEEP AND GOAT PRODUCTIVITY IMPROVEMENT PROGRAM

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Foreword

This technical bulletin titled "*Postmortem techniques for sheep and goats*" is the 33rd in a series produced by the Ethiopia Sheep and Goat Productivity Improvement Program (ESGPIP). The ESGPIP is a USAID funded Project with the objective of improving the productivity of Ethiopian sheep and goats in Ethiopia.

The technical bulletin has two sections. The first section describes the standard procedures for the postmortem examination of domestic animals. It is hoped that this section will help practicing veterinary professionals to adapt a working routine in performing postmortem examinations. The second (item No.9) focuses on simple procedures that can be performed by animal health assistants and, in their absence, by Kebele development agents under field conditions. The procedure described can be used as a tool that enables development agents to make timely and more informative reporting to higher veterinary services to take timely and informed action.

At this juncture, I would like to thank all those involved in the preparation and review of this technical bulletin.

Desta Hamito (Prof.),
Chief of Party,
ESGPIP
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Postmortem techniques for sheep and goats

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1. INTRODUCTION

Postmortem examination is the systematic examination of an animal's carcass to observe presence of any lesions. It is an important diagnostic tool and supports other procedures performed in the diagnosis of a disease in a herd or flock. Postmortem examination provides firsthand information on what really happened along the course of the disease. The conduct of a particular routine postmortem examination depends largely on the individual preferences of the examiner, the availability of materials and equipment and the extent of the examination required. It is often observed that improperly performed postmortem examination is characterized by voluminous information that has little importance to the diagnosis of a particular case in question but absence of information vital to the formulation of a diagnosis thus confusing the understanding of a disease process. A systematic approach in performing postmortem examinations is required so that appropriate and adequate information is gathered during the examination.

2. BASIC EQUIPMENT REQUIRED

The choice of equipment for postmortem examination depends on the size of the animal and the individual preferences of the examiner (Figure1). For most purposes:

- Knives
- Scissors
- Chopper
- Bone sheerer
- Forceps - lockable type or a lifting forceps with rat toothed or serrated tips that grasp tissues without slipping.
- Metal probe- made of stainless steel, copper or bronze, or an ordinary galvanized iron wire gauge 12 and about 25-30cm long is useful in probing connections and patency of openings.
- Mechanic hacksaw- useful for cutting bones and other hard structures.
- Butcher's steel rod or sharpening stone to keep the knives sharp.
- Weighing scales and measuring instruments like a millimeter rule and graduated cylinders or measuring cups for accurately measuring dimensions and volumes.
- Specimen bottles, one half-filled with 10% neutral buffered formalin for tissue samples.
- Sterile swabs and petri dishes for the collection of samples for microbiological examination (if required).
- Other materials that may be needed include disposable syringes and needles, glass slides, petridish, bucket, paper toweling, garbage container and thread for tying up hollow organs (Figure 2).

	
Figure 1. Basic postmortem equipment	Figure 2. Sampling facilities.

3. PROTECTIVE CLOTHING

- Protective clothing is required for protection from contamination with blood, tissues and body fluids from the body of the dead animal that are potential carriers of infectious particles. Wearing of a gown, rubber boots, gloves, and butcher's plastic vest is recommended.
- Wash protective clothing clean and disinfect after every use.

4. IMPORTANT POINTS TO NOTE

4.1. Time for postmortem examination

- The best time for postmortem examination is immediately after death of an animal for two reasons:
  - Decomposition (autolysis) which follows at a fairly rapid rate,
  - Post mortem invasion of the organs and tissues by normal microbial flora of the gut may make the isolation of the causative agent in question difficult or even impossible, especially in suspected bacterial infections.
- It is best to examine the cadaver immediately and collect the required specimens if histopathological examination of the diseased organs and tissues is necessary, This is particularly true if histopathological examination of the gastrointestinal tract is required. The microorganisms, enzymes and digesta make its decomposition more rapid than other parts of the animal cadaver.

4.2. Place for postmortem examination

- Extreme care should be taken in selecting sites for postmortem examination. The selected site should be **away from sources of feed and water**. Avoid sites frequently visited by other animals. Predators and other biological vectors of diseases should not be allowed access to the examination site.

- The place for postmortem examination should have adequate light, water, ventilation, drainage, provisions for cadaver disposal and provisions in lowering the chances of contaminating the surrounding.
- It is advisable to examine animals that died of suspected transmissible or zoonotic diseases in a laboratory.

4.3. Disposal of the carcass

All dead animal cadavers should be disposed carefully as they can be possible sources of contamination. Commonly used methods include:

- ***Incineration/burning:*** This is the best method. However, practical difficulties dictate that this procedure may not be suitable for large animals. The amount of time involved in the incineration and the amount of fuel required to turn the large heap of flesh and bones into ash reduce the usefulness of this procedure.
- ***Burying:*** Select a suitable site and dig a pit about 2 meters deep so that predators cannot have easy access to the disposed cadaver and also minimize the chances of contamination and pollution.

5. RECORDS

Before the postmortem examination procedure:

- **Case identification** - date of submission and examination.
- **Owner's identification** - include name, address, and phone number.
- **Specimen identification** - include the species, breed, age, weight, sex.
- **Clinical history** - include the details of clinical signs and symptoms observed and clinical diagnosis if possible.
  - ✓ Include the number of dead and affected animals in the herd or flock.
  - ✓ Describe the manner of spread of the disease in the herd or flock and the type and standard of husbandry when such a condition was noted.
  - ✓ Include also the date of first cases, subsequent losses and prior treatment given to the animal.
- **The examiner's detail**: including the name, qualifications, signature and the formulated diagnosis.

During the postmortem examination procedure: It is best to record all findings during the Postmortem examination. Taking pictures of lesions whenever possible is helpful.

6. THE POSTMORTEM EXAMINATION PROCEDURE

- **Observe the dead animal.** Carefully examine the animal's exterior. Note the body openings (mouth, nose, ears, eyes, prepuce, vagina and anus) for the presence of secretions/excretions/bleeding prolapse and color change of the mucus membranes. Do not open the carcass if there are any dark bloody discharges from these openings as the animal

may have died of anthrax. Anthrax is zoonotic and can contaminate the area and infect you! (Figure 3)

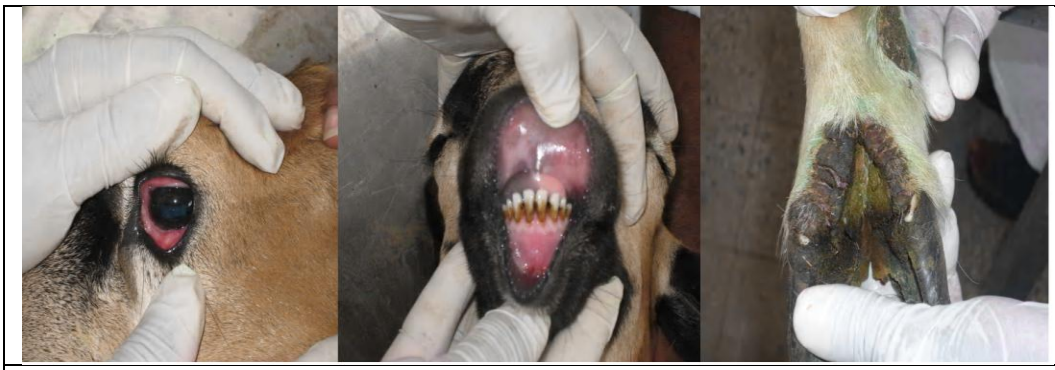

Figure 3. The mouth, eyes and foot (left to right) examined for any discharge, color change and presence of lesions.

- **Touch the body to check for any gas under the skin.** Does it crackle? If yes, there might have been clostridial infection. Examine the hair coat and note for the presence of ectoparasites, areas of thickening of the skin, crust formations, tumor masses, and possible wounds. If there are any ticks, take samples. Check all legs for foot rot and wounds.
- Position the cadaver with one side down, the feet facing the examiner. Make an incision on the ventral midline of the abdomen. Skin the abdomen and expose the underlying structures. Grasp and lift the forelimb upward and cut all muscles between the subscapular area and the rib cage to free the limb. While doing this, examine for the size, color and texture of the prescapular and axillary lymph glands. After cutting all attachments of the forelimb, reflect the limb to the dorsum of the cadaver.
- Hold the hind limb and cut the skin and underlying muscles of the hind flank. Reflect the freed hind limb to the dorsum of the cadaver. Continue skinning the ventral midline of the specimen from the incision made at the region of the rear flank and backward to the hind flank area. Reflect the skin to the dorsum of the cadaver. Note for any discoloration, bruises and prior bleeding points.
- Deeply cut the submandibular muscles and underlying structures close to the inner rims of the mandible at both sides. With the aid of a hacksaw, split the mandibles at its symphysis. Grasp the tongue and pull it backward. Cut all muscular attachments to free the tongue. Examine the palate, pharyngeal mucosa and tonsillar tissues. Drag the tongue backward and dissect the trachea and esophagus cutting all attachments up to the thoracic inlet.
- Palpate the free edges of the last rib and make a shallow incision sufficient to cut the abdominal muscles and peritoneum at this region while not cutting deeper structures. Lift the opening and continue cutting the abdominal wall from the dorsum and into the area of the xiphoid cartilage of the sternum. Continue cutting the abdominal wall at its dorsal and caudal boundaries down to the inguinal region. Check for the presence of ascitic fluid. If present, save as much fluid as possible for measurement of volume.
- Cut the sternal part of the diaphragm and note the presence or absence of negative pressure within the thoracic cavity. Continue cutting the costal part of the diaphragm close to the inner rims of the ribs. Cut the costo-chondral articulation from the last articulation and towards the

first rib. Detach the wall of the rib cage by cutting the neck of the ribs and associated intercostal muscles to expose the thoracic organs.

- Examine the exposed organs and note their position and appearance (Figure 4). Carefully lift the organs for a much-detailed examination of the whole structure. If clotted blood is present in any of the body cavities, carefully look for possible bleeding points.

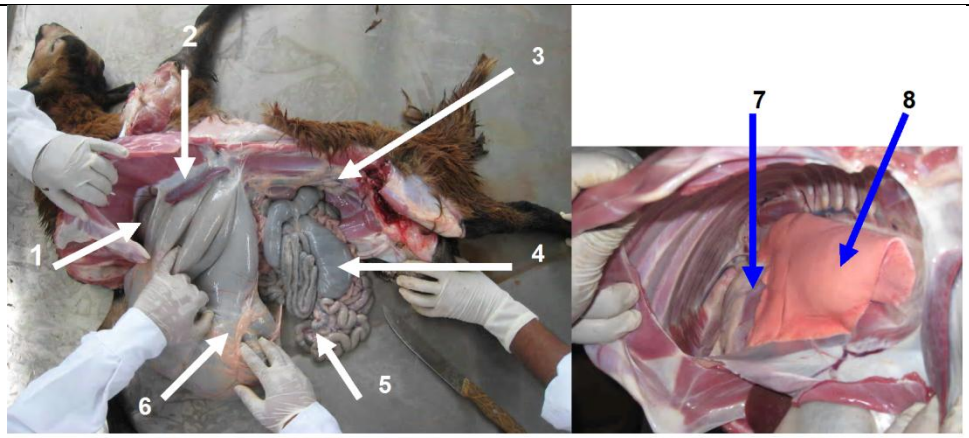

Figure 4. After opening of the cavities, the position and appearance of exposed organs are examined for displacement and any abnormal features (Left: opened abdominal cavity showing the liver (1), spleen(2), kidney(3), Large intestine(4), Small intestine(5) and rumen(6); right: thoracic cavity showing the heart (7) and the lung(8) in situ.

- The gastrointestinal tract should take priority in the examination. Their content of enzymes and bacterial flora render these organs to undergo rapid post mortem autolysis. Remove the entire alimentary tract from the rest of the carcass to minimize soiling of the carcass with spilling digesta from the opened alimentary tract segment (Figure 5). Note for the presence of ulcers, evidence of calcification, perforations, foreign bodies (omasum and reticulum), parasites, exudates and any pathological change if any.

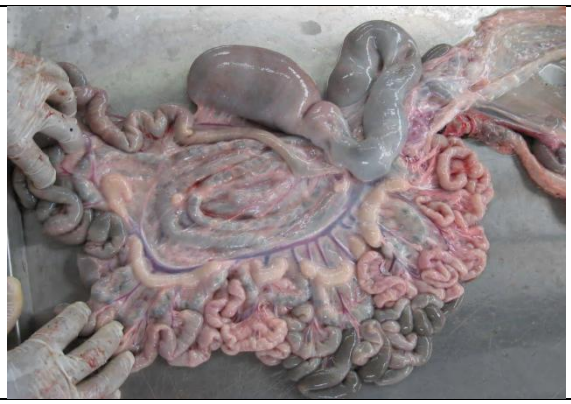

Figure 5. Gastrointestinal tract separated from the carcass and ready for examination. Note the presence of inflammation, perforation, parasites or any pathological changes.

- Remove the organs in the thoracic cavity by grasping the tongue, trachea and esophagus lying close to the thoracic inlet. While lifting these structures and pulling backwards, cut the pleural attachments of the lungs. Severe the aorta and other vessels to free the lungs and the heart.
- Inspect the dorsal and ventral surfaces of the tongue. Note for the presence of ulcers and suppurative foci and wounds. Palpate the tongue muscles and look for nodules or abnormal masses. Open the whole length of the esophagus and examine the mucosa for the presence of ulcers, strictures and abnormal tissue masses. Open the trachea and examine for hemorrhages, fluid or froth content, foreign bodies and broken cartilage rings. Continue examining the trachea down to its minute bronchial terminations in the lungs. Look for evidences of dilatation, collapse, foreign bodies, fluid and/or froth content.
- Examine the surfaces of the lungs and pleura by visual inspection and palpation. Look for changes in color and consistency of individual lobes, collapsed or dilated lobes and for the presence of abnormal tissue masses (Figure 6). Characterize areas of consolidations as to location and degree of involvement of lung parenchyma and its distribution. An apical distribution is most often an indication of bronchopneumonia.

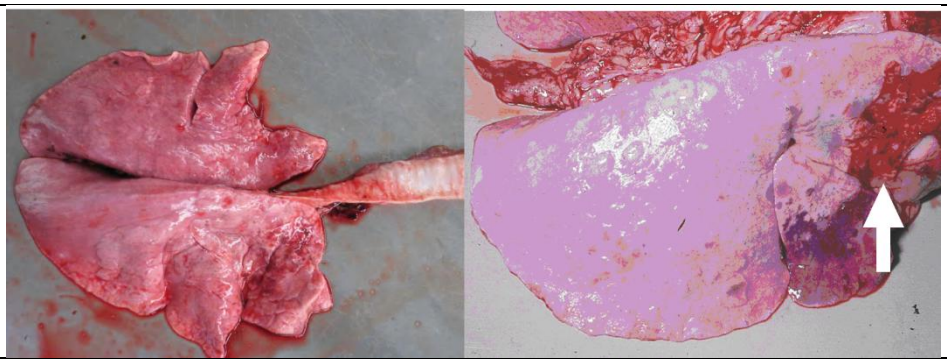

Figure 6. Normal lung from healthy sheep (Left); lung with bronchopneumonia (right) - note the anatomical location (arrow) where the lesion started.

- Grasp the heart on one hand and examine the outer surfaces of the pericardial sac for thickness and transparency (Figure 7). Open the pericardial sac and note the color, consistency and amount of pericardial fluid if any. Open the auricles and ventricles to examine the patency of the valves and presence of hemorrhages, degenerations or fibrosis on the surface of the endocardium.

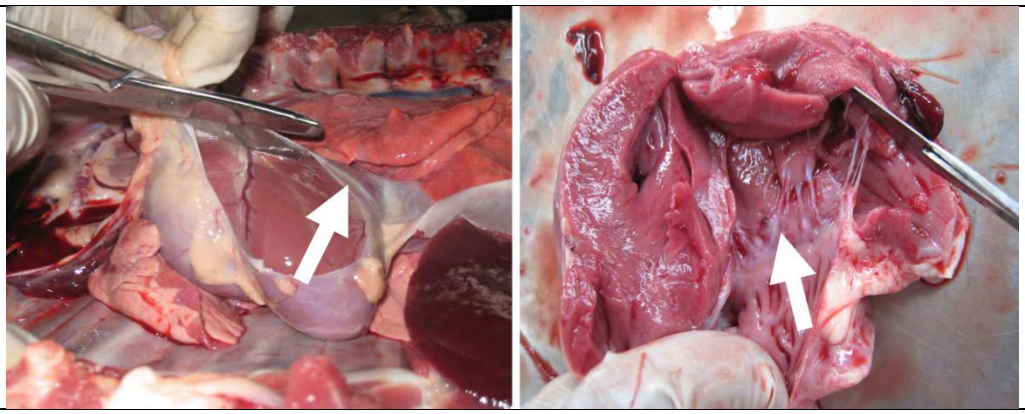

Figure 7. Normal heart from healthy sheep. Pericardial sac being opened to see the presence of fluid (Left, arrow); and opened heart ready for examination (Right, arrow).

- Examine the intact and cut surfaces of the liver and note for color, texture, size and consistency (Figure 8). Make several slices of the liver for closer inspection. Cut open the gall bladder and note the quality and color of bile.

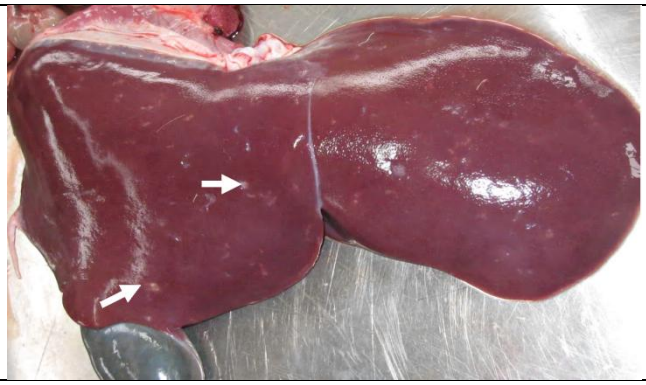

Figure 8. Liver taken from healthy looking sheep. Note for the multifocal scar (arrows) all over the surface of the liver.

- Examine the spleen for its length and edge. A normal spleen is firm, with sharp edges. Feel the consistency. If the spleen is enlarged and soft with a blunt edge, then suspect Anaplasmosis as a possible cause of death.
- Remove the kidneys from their attachments without severing the ureters. Grasp the kidney gently on one hand and cut it into halves longitudinally. Examine the kidneys for hemorrhages, areas of necrosis and/or infarcts, evidence of mineralization, and compare the thickness of the cortex to that of the medulla (Figure 9). Trace the opening of the ureter and cut it open until it enters the urinary bladder.

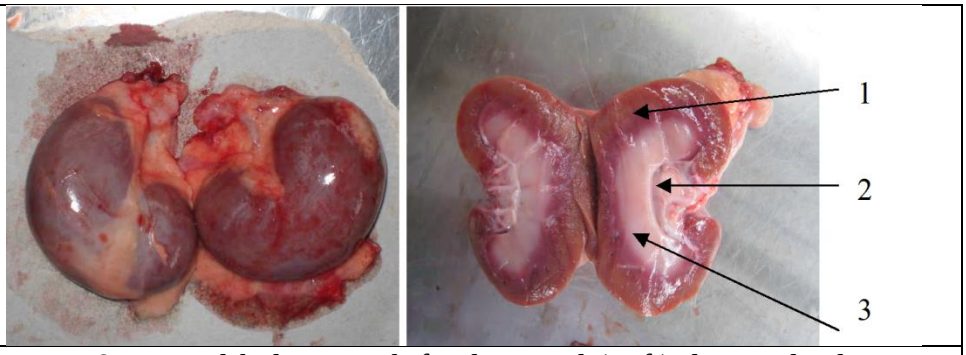

Figure 9. Normal kidneys with fat deposited (Left); longitudinal section of the kidney showing the cortex (1), medulla (3) and calyces (2) (Right).

- Puncture the urinary bladder, collect the urine and measure the volume. Cut the urinary bladder open and note for areas of hemorrhages, necrosis, presence of stones and fibrosis.
- Lymph nodes should also be examined whenever they are encountered during dissection.

7. DISEASE LESSIONS AND POSSIBLE CAUSES

Some gross lesions in different parts of the body which can lead to a diagnosis of the health problem of small ruminants are presented in Table 1.

Table 1. Gross lesions in different parts of the body that help diagnose of health problem of small ruminants.

Organ/part	Gross lesions	Diagnosis
Mouth	Macules, papules, vesicles, pustules scabs, scars /crust, and nodules in the corner of the mouth (fauces), mouth, in addition to other areas like udder, teat, coronary bands and anus.	Contagious ecthyma (Orf),
	Yellow gray round foci surrounded by a rim of hyperemic tissue in the oral cavity, larynx or pharynx or both,	Necrotizing stomatitides or calf diphtheria
Rumen	Watery ruminal contents often abundant grain, brown friable and easily detachable ruminal papillae	Lactic acidosis/grain overload/rumenitis
Abomasum	Dilatation and thickened wall deep red to purple mucosa, edematous/hemorrhagic s/t submucosa ooze with pus, less often emphysematous submucosa result in thickened gastric wall	Emphysematous gastriris caused by gas forming bacteria such as *C. perfringens, C. septicum*
	Fluid and brown abomasal content, abomasal folds may have diffuse or patchy congestions or no gross lesions at all, small white worms with red spiral pattern attacked to the wall,	*Haemonchus contortus*
Small Intestine	Neonates: Dilated, flaccid, enteritic and translucent fluid in the lumen, clinically accompanied with profuse yellow to white and watery to pasty diarrhea	Colibacillosis
	Petechiae, ecchymoses, paintbrush hemorrhage or diffuse hemorrhage f the serosa and mucosa; flaccid, thin-walled, dilated and often gas filled, s/t gas bubbles can be present in the wall. (often with gastric hyperemia, excessive pleural and peritoneal fluid, cooked appearance of muscles)	Enterotoxaemia (caused by *Clostridium perfingens*)
	Bloody intestinal content with nodule on the intestinal surface,	Coccidiosis.
	Strikes of hemorrhage in first portion of duodenum and terminal ileum, severely affected Peyer's patches	PPR
Large Intestine	Lesions around the ileo-cecal valve, cecocolic junction and rectum. Streaks of congestion along the folds of the mucosa resulting a characteristic 'zebra striped' appearance.	PPR
Lungs	Inflammatory involvement of the cranio-ventral part, exudation (fibrinous, purulent, or serous) in the lungs, pleural adhesion, distention of interlobular septa, hepatization, pleural fluid (straw colored or clear fluid),	Bronchopneumonia which can be seen in cases of pasteurellosis and Pleuropneumonia
	Multiple, large, caseous, calcified and well encapsulated granulomas scattered throughout the lungs.	Tuberculosis (uncommon in sheep and goats)
	Multifocal abscesses, randomly distributed in all pulmonary lobes,	Embolic pneumonia
	Diffuse lesions with no obvious orientation in the lungs; firm, meaty in texture and un-collapsed lungs, little exudates expressed on cut surfaces,	Interstitial pneumonia which can be seen during infection by herpesvirus, paramyxovirus, adenovirus, calicivirus, retrovirus, and prions; can also be seen in some toxic cases.
	Cyst of 5-15 cm in diameter in the lungs (and other visceral organs)	Hydatid cysts (intermidaite stage of *Echinococcus granulosus*)
	Adult worms and exudate in the bronchi,	Verminous pneumonia

Cont'd...

Organ/part	Gross lesions	Diagnosis
Heart	Pericardial fluid	Severe septicaemic/ viremic condition as in the case of pasteurellosis and blue tongue
Liver	Focal/multifocal necrosis	Parasite migrations such as those of visceral larva migrans of Ascaris spp, immature and mature flukes, localization of bacteria, vascular insults result to focal necrosis.
	Zonal necrosis (nutmeg appearance, or nutmeg liver)	Right-sided congestive heart failure, hepatotoxicity,
	Hepatitis (Focal, multifocal, diffuse)	parasitic lodgment, bacterial infections, and in immune mediated diseases,
Biliary system	Cholestasis	Damage to the biliary tree following inflammation and necrosis, biliary tree obstruction,
Spleen	Swollen, blunt edge,	Anaplasmosis, Trypanosomiasis
Kidney,	Putrefaction of kidneys within six hours after deaths (normal kidneys putrefy in 12-24 hours),	Enterotoxaemia (pulpy kidney).
	Dilatation of renal pelvis, renal parenchymal atrophy,	Hydronephrosis
Bladder	Haemorrhage, dots of blood	Poisoning
Ureter, Urethra	Concretion formed in these tracts	Urinary calculi (Uroliths)

8. SUBMISSION OF SPECIMEN SAMPLES TO THE LABORATORY

Postmortem examination is useful to support other auxiliary laboratory diagnostic procedures. Specimens for laboratory examination may be routinely collected as the examination progresses. The specimen collected should be appropriately labeled for proper identification. Information required for the identification of the specimen include:

- Species identification,
- Details of clinical history,
- Relevant postmortem examination findings,
- Type of samples and preservation used,
- Type of examination requested,

Specimens taken from suspected contagious / zoonotic cases should be adequately labeled to warn others about the potential of spreading the infection or pose danger to the biological system or to those handling the specimen. Handle the specimens intended for different types of examinations as indicated below:

8.1 Histopathological specimens

- Specimens intended for histopathological examinations should be fixed in 10 times the tissue volume of 10% neutral buffered formalin.
- The pieces of organs and tissues should be collected as soon as possible and should not be more than 0.5 cm thick.
- Collect the tissue block using a sharp knife or a razor blade. Crushing the specimen or allowing it to dry will cause undue distortions on the morphology of cells and tissues. Moreover, the tissue block should be selected and should include both the normal and abnormal portion of the organ or tissue.

- Segments of the gastrointestinal tract should be taken the soonest possible time and immediately after opening the cadaver to minimize post mortem changes. Cut open the segment of the gastrointestinal tract longitudinally before putting the segment in the fixative to increase the surface area for the penetration of the fixative.

8.2. Microbiological specimens

- Collect specimens intended for microbiological examination aseptically. It is recommended to sear the surface of the organ or tissue with a hot spatula, then incise and collect the required material from the deeper portion of solid organs, abscess, or coagulated masses. From this incision, sterile swabs, tissue fragments, and aspirates may then be taken. Place sterile swabs and aspirates in special transport media, especially if the suspect organism is a fastidious one.
- Should sterile swab be required, it should be taken immediately before fully opening the organ or cavity.
- Hollow organs such as segments of the gastrointestinal tract are best handled by obtaining a loop tied at both ends and placed in a sterile petri dish**.**

8.3 Parasitological specimens

- Occasionally, ectoparasites and endoparasites are collected during postmortem examination for identification. Collect samples of ectoparasites before the cadaver is cut open for examination. Ticks, fleas and lice should be carefully brushed off from the fur/hair and preserved in 70% ethyl alcohol or methanol. To disable these organisms, wet the fur /hair of the animal with a detergent solution. In collecting ticks, avoid damage to the mouthparts.
- Collect mange mites by scrapping the affected skin deeply and put the scrapings in a glass slide with a drop of mineral oil.
- Roundworms collected from intestinal segments may be fixed in 70% ethyl alcohol or methanol immediately after collection. Tapeworm segments collected should include both mature and immature segments, with the scolex still intact. Never lift the tapeworm from its attachment for it will break the scolex. The scolex is important in species identification.
- For total worm count in ruminants, tie the abomasum at both ends and save all its contents. Deeply scrapping the mucosa of the affected intestinal segment and examining the scrapings as a wet smear may do the diagnosis of coccidial infection.

8.4 Blood and Body Fluids

- It is preferable to take blood from live animals. In some cases, blood samples may still be obtained from animals that have died before three to four hours. This is done by aspirating the blood contained in the heart prior to detachment and dissection of the chambers.
- If sera are required, it is best to collect blood in a glass receptacle to promote clotting. Wet and thin smears can be done for hemoparasitic examination.
- The general rule in collecting body fluids is to obtain samples free from contaminants. Body fluids should be collected as the examination progresses if it is anticipated that such examination is required.

9. SIMPLE PROCEDURES FOR KEBELE DEVELOPMENT AGENTS (KDAs)

Knowing the cause of death is important to prevent spread of infectious diseases to other healthy animals in the flock and to neighboring flocks. In case there are no animal health personnel nearby, the KDA needs to carry out a simple post mortem examination to find out the cause of death. The following procedures are recommended for the KDA to do simple field level examination in the absence of a health professional. This can be prepared in the form of a report to relevant bodies, send specimens to veterinary laboratories so that appropriate action can be taken.

Post mortem examination is an examination of a dead animal that includes inspection of both internal and external organs for abnormalities and signs of disease that may disclose the possible causes of the animal's death. The examination of the carcass must be systematic. The abdominal and chest cavities need to be opened so that the internal organs may be thoroughly investigated. The rumen can be opened lengthwise and the stomach contents explored.

Preparations required performing a post mortem examination:

- Find an area that is isolated from other animals and nearby houses near a place where the dead animal can be burned or buried at a depth of about 2 meters.
- Never perform a post mortem near any water supply, or close to a grazing area.
- Dig a small hole beside the carcass, into which organs and fluids can be placed.
- Wear protective (working) clothing. Wash well with soap and water after post mortem is finished.
- Normally, the postmortem should be carried out in a covered fly-proof shed. However, such sheds may not be available under field conditions. In this case, select a suitable location under the shade of, for example, a tree. Spread plastic sheets on the floor to minimize contamination of the surrounding.

Procedure for the post mortem examination:

- Observe the dead animal. If there are any dark, bloody discharges from the natural openings (mouth, nose and anus), do not open the animal as it may have died of anthrax. Anthrax spores can contaminate the area and infect the person doing the post mortem.
- Touch the body to check for any gas under the skin. Do you notice signs of a crackle? If yes there might have been clostridial infection. Check the body for any external abnormalities. Check for ticks. Take samples if you find ticks. Check all legs for foot rot and wounds.
- Lay the body on its back or side and cut the skin in a line along the centre of the abdomen and chest. Remove the reproductive organs (testicles or udder). Pull the skin back. The right fore and hind limbs are detached at the base after skinning and averted aside.
- Open the body by cutting the ribs along the line of the back bone and cutting the ribs along the chest and removing the rib cage.
- After opening the thoracic and abdominal cavities, examine the position, appearance and any abnormal features of organs.
- Remove the whole digestive tract with the liver and spleen without opening it.

- Then you examine each of the organs more closely for any abnormalities. Abnormalities of different organs for common diseases that exist in Ethiopia are indicated in table 1.
- Cut the lower jaw on the right side and pull out the tongue and detach it from the skull. Slowly pull out the trachea, the lung, and heart and put them in a tray.
- Then, the organs from the abdominal cavity require a slower pulling of the intestine by cutting and dissecting the portion. The esophagus should be tied just behind the diaphragm before cutting and removal for later examination.
- Look for the kidneys at the back of the abdominal cavity. Remove the kidneys after separating from the fat and keep for further examination.

Examination of the different organs:

- **Bladder:** Open the bladder and observe the color and quantity of urine. Check inside the bladder for any dots of blood. If so, suspect poisoning.
- **Spleen**: Locate the spleen attached to the rumen and close to the liver. Check the length and edge of the spleen. Is the edge sharp or blunt? A normal spleen is firm, with sharp edges. Feel the consistency. If the spleen is enlarged and dark and the gall bladder is distended, then you may suspect the cause of death to be Anaplasmosis. If the carcass is very thin and the spleen and lymph nodes are swollen, suspect Trypanosomiasis.
- **Liver:** Check the liver for holes due to break down of liver tissue and whether the bile ducts are white, thickened and firm. If so, you can suspect Fascioliasis. Mature flukes are usually visible in the bile ducts in this case. To confirm the presence of Fascioliasis, cut the liver across the length in 2-3 places and press it. Dark colored flukes will come out.
- **Lungs:** Check the lungs by opening the trachea. Check for foam, worms, and blood. If you find adult worms in the bronchi, it indicates lungworm infestations. The lungs are enlarged and solid, sink when put in water, are reddish-purple to pink gray in color in case of contagious caprine pleuropneumonia (CCPP). The affected parts of the lung are covered with yellowish fibrinous deposits. You may also see some yellow pus on the lungs. They often stick to the side of the chest. There is also a large quantity of fluid in the pleural cavity. In case of Pasteurellosis, there is swelling of the lung and lymph nodes. The lower part of the lung is red.
- **Kidneys:** Check the kidneys; they will normally start to putrefy 12-24 hours after death. However, if the kidneys deteriorate rapidly and appear soft, the cause of death could be enterotoxaemia.
- **Small intestines:** If you observe any dark area open it. If not, open randomly and remove the contents into a container, cut along the length and check for any attached worms. If the contents are bloody and thickening of intestine observed coccidiosis could be suspected.
- **Large intestines:** check if there is sever congestion in the intestines. You may suspect Peste des Petits Ruminants (PPR) if you observe different stripped coloration on the inside of the intestines (the so called zebra markings), .
- **Rumen:** open the rumen and remove the contents. If you find small red worms attached to the inside of the rumen wall, you may suspect paramphistomiasis.
- **Abomasum:** put contents into a container and wash the wall of the abomasum into the container. If you find small white worms with red spiral patterns attached to the wall you may suspect *Haemonchus contortus*.

Taking samples during post mortem Examination:

The KDA can take the following samples and submit it to the nearest veterinary clinic and or laboratory for further investigation.

- Any organ found abnormal both the affected part and normal part of the organ can be taken fully as a sample.
- Put the organ in a plastic or glass container.
- Clearly label the sample, and take it to the nearest animal health clinic as soon as possible with a copy of the post mortem examination record.

Disposal of dead animals and carcass after post mortem examination:

- Burial is the easiest and most common approach to dispose dead animals. The burial site should not be less than 30 meters from water point and it should not be a place where easily flooded with surface water. The hole should be at least 1 meter deep. Cover the buried animal well to prohibit excavation by dogs and other predators.
- If the cause of death is suspected to be anthrax, put quicklime under and above the dead animal.

10. REFERENCES

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