

TECHNIQUE FOR POST- MORTEM EXAMINATION (Necropsy)

I- Post-mortem examination of poultry:

A- CASE HISTORY

Species

Breed

Sex

Age

Number

System of housing

Nutrition

History of previous vaccination and medication

B- EXTERNAL EXAMINATION

- Examine the bird for any signs of trauma and evaluate the bird's general body condition.
 - If possible the bird should be weighed.
 - The keel bone should be felt to determine if there is any pectoral muscle atrophy.
- The skin, feathers, eyes, ears and beak should be examined for any abnormalities. Take a close look at the comb and wattles – any swelling? Discoloration? Look at the back of the bird for evidence of feather picking.
- If any skin lesions are noted, they should be sampled.
- Examine all mucous membranes (mouth, nares, and conjunctiva) for any discoloration or other abnormalities. How about the cloaca? Any diarrheal staining? Urates present? Trauma?
- Look at the joints - any swelling?

After careful external examination moistening the birds with water.

Keeps down the dust and prevents the feathers from flying out during necropsy.

C- Opening the body cavities:

- 1- Grasp both legs from the stifle joint and pull them laterally to break the skin and at the same time to break the coxofemoral joints.
- 2- The skin and the feathers are removed by digital dissection from the peak to the anus and from the sides of the neck and body.
- 3- Watch the condition of the breast and S/C blood vessels for any abnormalities.
- 4- A straight cut is made through the abdominal wall and extended to either side of the abdomen and forward along the articulation of the ribs.
- 5- Then the breast is removed for exposing both the abdominal and pleural cavities.
- 6- Notice the presence of any exudates or blood inside the thoracic and abdominal cavities.
- 7- Examine the viscera in situ before removal.

D- Remove the organs and set aside for examination

- 1- Open the pericardial sac and cut off the heart from its base.
- 2- The liver and spleen are removed together.
- 3- Cut the esophagus just in the front of the proventriculus to remove proventriculus, gizzard, pancreas, small and large intestines including caeca and colon.
- 4- The oviduct is cut at the cloaca and removed with the ovary that must be examined carefully
- 5- Cut across the base of the peak to open the nasal cavity and inspect sinuses.
- 6- Makes a cut through the right corner of the mouth and continue through the throat, esophagus and crop.
- 7- Another cut made through the larynx to open the trachea through its length to the lower larynx or syrinx following the bronchi into the lungs.
- 8- Remove lungs from the thoracic cavity and examine the air sacs for inflammation and any abnormal exudate.
- 9- The kidneys are examined in situ.
- 10- The skin is removed from the back for examination of the brachial plexus between the scapula and vertebral column.

- 11- Ischiatic nerves are examined in each leg.
- 12- Open the proventriculus and gizzard and inspect the mucosa and glands
- 13- Open the entire intestine and examine its contents.
- 14- The ceca are open and the contents are examined for the presence of exudates and other inflammatory changers.
- 15- The bursa of Fabricious (situated dorsally to the cloaca) must be examined and
- 16- Joints should be opened and inspected.

E- Examine and sample the organs:

1. It is a good idea to go from the “cleanest” organs to the “dirtiest”. Usually this order is: lymphoid tissue, brain, lungs, heart, kidneys, reproductive tract, liver, intestinal tract.
2. Spleen in birds is a small round organ that should be a uniform mahogany color on capsular and cut surfaces.
3. Bursa changes dramatically with age. Birds older than 10 weeks will have a bursa that may even be difficult to locate. A normal bursa in a young bird has an accordion-like structure and is a homogeneous tan.
4. Often the brain is sliced down the middle to create symmetrical halves for frozen and formalin specimens
5. The heart can now be examined. Make one incision into each ventricle, examine muscles and valves.
6. Begin by cutting through the larynx, trachea, and syrinx making note of any mucus, froth, or petechiae. Lungs should be pink, “spongey”, and free of any fluid.
7. These should be smooth and homogeneous. A reticular pattern is an indication of dehydration.
8. Testes are homogeneous on capsular and cut surfaces.
9. Ovaries should be free of inflammation. Sterile egg yolk peritonitis is a common finding in “spent” layers.
10. The liver’s surface should be examined for any abnormalities. It should be palpated for any nodules, friable areas, or other abnormal changes. Several slices are made into the liver in order to examine the deeper structure of the liver.
11. Look in the mouth for any abnormalities. Cut down the esophagus and see how much food is in the crop.

12. Open the proventriculus and make note of the lining which is normally bumpy due to the presence of digestive glands. Note any abnormalities.
13. The ventriculus, or gizzard, should be examined next. Because the gizzard is responsible for grinding ingested material, it has a thick external muscularis layer and contains small stones or grit. The ventricular glands secrete a thick protective gel, known as koilin, which has a yellowish color. The gizzard thickness should be examined and the surface examined for erosions, ulcerations, discoloration, or other abnormalities. Peel the koilin back to look at the mucosa.
14. The proventriculus-ventriculus junction (arrow in middle photo) is an area with abundant lymphoid tissue and should be examined carefully for lesions.
15. The small intestine of birds is typically arranged into several loops before entering the colon. The first loop is the duodenum it is easily identified by the location of the pancreas within the duodenal loop mesentery.
16. The remaining loops make up the jejunum and ileum. The colon is relatively short with two long ceca and connects to the cloaca via the colorectum.
17. In this picture you see the two ceca and the large colon in between. There are large lymphoid patches in the proximal portions of the ceca.
18. Note any abnormalities for each (color, size, shape, consistency, exudates). Be sure to examine both capsular and cut surface. Make several cuts in each organ. Collect specimens for further diagnostic work.

Sampling of organs -

1. Tissues should be collected in duplicate, with half going into 10% formalin for histopathology and half as unfixed tissues that will be used for bacterial culture, virus isolation, fluorescent antibody testing, toxicology, etc.
2. The following tissues should be collected in all cases: lung, liver, spleen, bursa, brain, kidney, intestines. Additionally, any other tissue that might have lesions (skin, adrenal, ovary, etc.) should also be collected.
3. Label the tissues that are collected fresh so that the technician performing the tests can determine what each tissue is.
4. Crushing should be avoided when taking samples since this may cause artifact histologically. This can be avoided by using a sharp blade and a hard surface.
5. When examining any organ with a mucosal surface (trachea, esophagus, intestine, etc.) care should be taken not to damage or destroy the mucosal surface by rubbing the surface with fingers or instruments.

6. In order to improve fixation of tissues, samples should not exceed 5mm in thickness and volume of fixative should be at least 10 times the volume of tissue. Fresh samples should be packaged so that they remain cool and to minimize possibilities of leaking. Be sure to submit the proper paperwork to accompany the samples.

II- Post-mortem examination of equines:

- 1- The carcass should lie on its right side.
- 2- Inspect the carcass for fractures, external parasites and general condition.
- 3- Remove the left hind leg by cutting through the medial thigh muscles and by opening the hip joint. The left fore leg should be cut and removed.
- 4- Remove the mammary gland in female and separate the penis from the abdominal wall and release the testes to the external inguinal ring in the male.
- 5- Remove the skin from the lateral left side of the abdomen, thorax and neck.
- 6- Incise the stump of the brachial artery so that all the unclotted blood can draw from the large vessels of the thoracic inlets.
- 7- Remove the whole upper wall of the body cavity by incise the midline from the rim of the pelvis to the xyphoid cartilage. Continue the incision from the pubis dorsally to the upper coxae then turn anteriorly until the last rib adjacent to the lateral lumber process.
- 8- Continue the incision by lowering the ribs at their dorsal ends from the last rib to the dorsal end of the thoracic inlet.
- 9- The ventral ends of the ribs are severed a long a straight line from the ventral end of the thoracic inlet to the xyphoid cartilage just dorsal to the body of the sternum and thus the whole upper wall of the body cavity is removed after severing of the diaphragm.
- 10- Inspect organs for abnormal position particularly the large intestine.

Removal of abdominal organs:

- 1- Seize the pelvic flexure of the great colon and drag it out ventrally from the body cavity together with the caecum.
- 2- Remove the spleen and omentum.
- 3- Remove the left kidney and left adrenal gland.
- 4- Draw the small colon b and lay it over the region of the ileum.
- 5- Remove the small intestine, cut the duodenum, and straighten the small intestine.

- 6- Make two ligatures and cut the ileum to remove the small intestine outside the carcass.
- 7- Remove the stomach by cutting through the esophagus and pylorus using two ligatures.
- 8- Open the anterior mesenteric artery and its branches then inspect them for verminous thrombus and aneurysms.
- 9- The large intestine is removed as a whole starting with cutting the rectum between two ligatures.
- 10- Remove the liver together with pancreas and duodenum.
- 11- Remove the right kidney and adrenal.
- 12- Remove the anterior mesenteric plexus with the aortic attachment.

Removal of pelvic organs:

- 1- Remove the pelvic floor by sawing through the pubis and ischium passing through the obturator foramen in both sides.
- 2- Remove the urogenital organs intact.

Removal of thoracic organs:

- 1- Remove the tongue by making a deep incision along the inner sides of both mandibular rami then pull the tongue through the intermandibular space.
- 2- Cut through the soft palate by V- shape incision with its apex directed forward.
- 3- Cut through the articulation of the hyoid bone and then release the tongue, trachea, esophagus and lungs with the heart by releasing their attachment.
- 4- Make several incision through the lungs and bronchial and mediastinal lymph nodes.

Removal of the brain:

- 1- Disarticulate the head at the atlanto-occipital joint.
- 2- Make a deep transverse cut just behind the posterior margin of the orbits.
- 3- It is connecting in each side with the dorsal part of the foramen magnum by a lateral cut made with a saw.
- 4- These cuts must be deep where they meet in the temporal fossa, but along the sides they must be shallow to avoid cutting the brain.
- 5- Remove the cut calvarium and let the dorsal surface of the head make an acute angle with the table.
- 6- Sever the olfactory nerves, optic nerves and other attachments until the brain fall gently on the table.

Examination of the lymph nodes, joints and the muscles:

- 1- Longitudinal incisions are made in a various lymph nodes.
- 2- Open the joints from the medial side beginning with distal ones.
- 3- Make several incisions in the muscles particularly these of the back, medioproximal parts of the limbs and iliopsoas muscles.

III- Post-mortem examination of ruminants:

- 1- Place the animal on its left side; otherwise the general procedures are similar to those described for equine until completing the removal of the upper wall of the body cavities.
- 2- Examine the body cavities carefully for exudates, transudate, adhesion or displacement of organs.
- 3- Cut the large omentum away along its attachment and remove the small omentum.
- 4- Remove the stomach by cutting through the esophagus and duodenum between the ligatures and pulling the stomach back and out by releasing its attachments.
- 5- Remove the spleen from beside the rumen.
- 6- Cut the duodenum at the sigmoid curve and the rectum and remove the intestine with mesenteric root.
- 7- Remove duodenum, pancreas and liver.
- 8- Open the abdominal aorta in situ.
- 9- Remove the tongue, trachea, esophagus and lungs as described for equines.
- 10- Remove the urogenital system as described before.

