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Images of Diseases

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Images of Diseases

Abstract
The chapter contains annotated color images of emerging diseases and exotic diseases in wild and domesticated animals.

Keywords
zoonoses, infectious diseases, parasitology, animal diseases

Disciplines
Large or Food Animal and Equine Medicine | Veterinary Infectious Diseases | Veterinary Pathology and Pathobiology

Comments
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SECTION 3

Emerging and Exotic Diseases of Animals

IMAGES OF DISEASES

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Armed Forces Institute of Pathology (AFIP), Education Branch, Division of Research and Education, Department of Veterinary Pathology, Washington, D.C.

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African Horse Sickness
African Swine Fever
Akabane
Anthrax
Aujeszky's Disease
Avian Influenza
Baylisascariasis
Bluetongue
Botulism
Bovine Babesiosis
Bovine Tuberculosis
Brucellosis
Chlamydiosis, Avian
Chlamydiosis, Mammalian
Classical Swine Fever
Contagious Bovine Pleuropneumonia
Contagious Equine Metritis
Dourine
Echinococciosis
Enteroheamorrhagic Escherichia coli Infections
Epizootic Lymphangitis
Equine Infectious Anemia
Equine Piroplasmosis
Equine Viral Arteritis
Foot and Mouth Disease
Fowl Typhoid and Pullorum Disease
Glanders
Heartwater
Hemorrhagic Septicemia
Hendra Virus Infection
Influenza
Japanese Encephalitis
Leishmaniasis (cutaneous and visceral)
Louping Ill
Lumpy Skin Disease
Maedi-Visna
Malignant Catarrhal Fever
Meliodosis
Monkeypox
Mycoplasmosis, Avian \((Mycoplasma gallisepticum)\)
Newcastle Disease
Ovine Pulmonary Adenocarcinoma (Adenomatosis)
Paratuberculosis
Plague
Q Fever
Rabbit Hemorrhagic Disease
Rift Valley Fever
Rinderpest
Screwworm Myiasis
Sheep & Goat Pox
Swine Vesicular Disease
Theliriosis
Ticks (Exotic)
Transmissible Spongiform Encephalopathies
Trypanosomiasis, African
Trypanosomiasis, American (Chagas Disease)
Tularemia
Vesicular Stomatitis
Viral Hemorrhagic Septicemia

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University of Melbourne, Australia
African Horse Sickness

Horse. Abundant froth draining from the nostrils reflects severe pulmonary edema.
Source: PIADC

African Horse Sickness

Horse, peritoneal cavity. There is excessive straw-colored fluid (hydroperitoneum).
Source: PIADC

African Horse Sickness

Horse, heart. There are many subendocardial hemorrhages.
Source: PIADC

African Horse Sickness

Horse, heart. The pericardial sac contains excessive, slightly turbid straw-colored fluid (hydropericardium).
Source: PIADC

African Horse Sickness

Horse, cecum. There are serosal petechiae on the apex of the cecum.
Source: Noah's Arkive, PIADC
African Swine Fever
Pig. There is bloody, mucoid, foamy nasal discharge.
Source: PIADC

African Swine Fever
Pig. There is marked hyperemia of the distal limbs.
Source: PIADC

African Swine Fever
Pig, perineal skin. There is a large sharply demarcated zone of hyperemia.
Source: PIADC

African Swine Fever
Pig. There are multiple sharply demarcated foci of cutaneous hemorrhage and/or necrosis; hemorrhagic lesions may contain dark red (necrotic) centers.
Source: PIADC

African Swine Fever
Pig, limbs. There is marked hyperemia of the distal limbs.
Source: PIADC

African Swine Fever
Pig. There are multiple sharply demarcated foci of cutaneous hemorrhage and/or necrosis; hemorrhagic lesions may contain dark red (necrotic) centers.
Source: PIADC

African Swine Fever
Pig, skin. Necrotic exudate is sloughing from the lesion on the left. There is a rim of hyperemia around the focus of hemorrhage and necrosis (infarct) on the right.
Source: PIADC
African Swine Fever
Pig. kidney. There is moderate perirenal (retroperitoneal) edema.
Source: PIADC

African Swine Fever
Pig. kidney. Petechiae are disseminated throughout the cortex, and there are larger coalescing pelvic hemorrhages.
Source: PIADC

African Swine Fever
Pig, kidney. Close-up of cortical petechiae.
Source: PIADC

African Swine Fever
Pig. kidney. The cortex contains numerous coalescing petechiae and ecchymoses.
Source: PIADC

African Swine Fever
Pig, urinary bladder. There are disseminated mucosal petechiae.
Source: PIADC

African Swine Fever
Pig. heart. There is abundant straw-colored pericardial fluid (hydropericardium), and multifocal epicardial hemorrhage.
Source: PIADC
African Swine Fever
Pig, heart. Subendocardial hemorrhage.
Source: PIADC

African Swine Fever
Pig, stomach. There is "paintbrush" hemorrhage on the serosa.
Source: PIADC

African Swine Fever
Pig, stomach. The hepatogastric lymph node is markedly enlarged and hemorrhagic, and the adjacent lesser omentum is edematous.
Source: PIADC

African Swine Fever
Pig, lung. The lung is noncollapsed and edematous; there is dorsal hemorrhage and ventral tan consolidation.
Source: PIADC

African Swine Fever
Pig, mandibular lymph node. There is moderate peripheral (medullary) hemorrhage.
Source: PIADC

African Swine Fever
Pig, stomach. The stomach is filled with clotted blood, and the wall is markedly edematous.
Source: PIADC

Emerging and Exotic Diseases of Animals
**African Swine Fever**

Pig, cecum. Mucosa is markedly edematous and hyperemic, and lymph nodes are hemorrhagic.

Source: PIADC

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**Akabane**

Bovine neonate (Aino). This stillborn calf exhibits torticollis and arthrogryposis.

Source: Dr. K. Kawashima, National Institute of Animal Health, Japan

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**Akabane**

Bovine neonate, brain. The entire brain is reduced in size (microencephaly), and surrounded by cerebrospinal fluid.

Source: Dr. K. Kawashima, National Institute for Animal Health, Japan

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**Anthrax**

Bovine, lymph node. The node is hyperemic and contains multiple dark foci of hemorrhage.

Source: AFIP

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**Anthrax**

Human, skin. Lesions are raised and have necrotic centers.

Source: AFIP
**Anthrax**

*Bacillus anthracis* is a large, blunt- to square-ended bacterial rod that forms short chains.

Source: ISU CVM

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**Avian Influenza**

Chicken, head. The comb and wattles are congested and markedly edematous.

Source: Dr. D. Swayne, USDA

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**Avian Influenza**

Chicken, shanks. The shanks are swollen (edema) and extensively reddened (hemorrhage).

Source: Dr. D. Swayne, USDA

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**Avian Influenza**

Chicken, lung. The lung is diffusely reddened, wet, and swollen (congestion and edema).

Source: Dr. D. Swayne, USDA

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**Aujeszky’s Disease/Pseudorabies**

Pig, head. The mucosal membranes around the eye and nares are crusted, and the eye has periorbital serous exudate.

Source: AFIP
Avian Influenza

Chicken, proventriculus. There are multiple hemorrhages on the mucosal surface of the proventriculus.
Source: Dr. D. Swayne, USDA

Baylisascariasis

Raccoon, feces. *Baylisascaris procyonis* eggs are typical ascarid eggs with thick, finely pitted shells; slightly smaller than *Toxocara canis* eggs.
Source: PIADC

Bluetongue

Sheep. There is bilateral nasal exudate, erosion of the nasal plenum, and excessive salivation.
Source: PIADC

Avian Influenza

Chicken, intestine. There are serosal hemorrhages over the Peyer’s patches.
Source: Dr. D. Swayne, USDA

Baylisascariasis

Raccoon, intestine. A partially opened small intestine contains many adult *B. procyonis*.
Source: Dr. A. Hamir, ARS, USDA

Bluetongue

Sheep, mouth. There is linear erosion and reddening of the right buccal mucosa.
Source: PIADC
**Bluetongue**

Bovine. The muzzle is covered by an adherent crust, and the underlying (eroded) tissue is hyperemic.
Source: PIADC

**Bluetongue**

Bovine, mammary gland. There is extensive coalescing ulceration of the teat skin.
Source: PIADC

**Bluetongue**

Sheep, foot. There are multiple petechiae in the hoof wall, and there is marked hyperemia of the coronary band.
Source: AFIP

**Bluetongue**

Sheep, mouth. Most of the dental pad is eroded; the remaining pale mucosa is necrotic.
Source: AFIP

**Bluetongue**

Sheep, pulmonary artery. There are multiple ecchymoses on the intimal surface.
Source: AFIP

**Bluetongue**

Sheep, tongue. The lateral mucosa contains several ulcers that are covered by exudate and surrounded by zones of hyperemia.
Source: PIADC
Bluetongue
Sheep, skeletal muscle. There is a focus of hemorrhage on the tendons. Pale areas are consistent with myodegeneration.
Source: AFIP

Bluetongue
Sheep, tongue. There are disseminated mucosal petechiae, and a single large vesicle on the tip.
Source: AFIP

Bluetongue
Sheep, fetuses. The larger of these aborted macerated fetuses exhibits torticollis.
Source: PIADC

Bluetongue
Sheep, eye. There are foci of bulbar and palpebral conjunctival hemorrhage.
Source: AFIP

Bluetongue
Sheep, rumen. There are multiple mucosal hemorrhages centered on the pillars.
Source: AFIP

Botulism
Mink. Flaccid paralysis characteristic of botulism.
Source: AFIP
Botulism
Duck. Flaccid paralysis characteristic of botulism.
Source: AFIP

Bovine Babesiosis
Bovine, blood smear. Two erythrocytes contain pairs of ovoid Babesia bovis.
Source: AFIP

Bovine Babesiosis
Bovine, brain. The cerebral cortex is diffusely reddened (“cerebral flush”).
Source: AFIP

Bovine Tuberculosis
Elk, lung and lymph node. Lung contains multiple coalescing foci of caseous necrosis surrounded by thin pale fibrous tissue capsules (tubercles).
Source: Dr. G. Wobeser, CCWHC

Bovine Tuberculosis
Bovine, lung. Lung parenchyma is almost entirely replaced by variably-sized, coalescing, raised pale nodules.
Source: AFIP
**Bovine Tuberculosis**

Pig, tracheobronchial lymph nodes. The center of the sectioned node is replaced by caseous, mineralized debris.

Source: AFIP

**Brucellosis**

Bovine, placenta. Numerous pale clumps of exudate are scattered over the cotyledon and adjacent chorion.

Source: AFIP

**Bovine Tuberculosis**

Pig, liver. Pale, slightly raised granulomas are disseminated throughout all liver lobes.

Source: AFIP

**Brucellosis**

Caribou, carpus, *B. suis* biovar 4. The carpal bursa is markedly swollen and fluctuant.

Source: Dr. G. Wobeser, CCWHC

**Brucellosis**

Caribou, carpus, *B. suis* biovar 4. The carpal bursa contains purulent exudate.

Source: Dr. G. Wobeser, CCWHC
Brucellosis

Bovine, placenta. The placenta contains numerous hemorrhagic cotyledons.
Source: AFIP

Brucellosis

Sheep, testis (bisected). The epididymis is markedly enlarged and contains bands of fibrous tissue (chronic epididymitis). In this case, the testis itself is relatively unaffected.
Source: AFIP

Chlamydiosis, avian

Avian, liver. Sheets of fibrinous exudate partially cover the capsular surface of the liver.
Source: AFIP

Chlamydiosis, mammalian

Koala, eye. Reddened conjunctiva with a focal erosion and serous exudate.
Source: AFIP

Chlamydiosis, mammalian

Bovine, skin, fetus. Ulcerated reddened foci on the skin of an aborted fetus due to Chlamydia psittaci.
Source: AFIP

Chlamydiosis, mammalian

Bovine, kidney. Diffuse petechial hemorrhages are present in the kidney.
Source: AFIP
Classical Swine Fever

Pig. The distal pinnae contain coalescing dark red foci of hemorrhage and necrosis (infarction).
Source: USDA

Classical Swine Fever

Pig, kidney. There are numerous disseminated cortical petechiae ("turkey egg kidney").
Source: PIADC

Classical Swine Fever

Pig, retropharyngeal lymph node. The lymph node is markedly enlarged and hemorrhagic; the tonsil contains multiple poorly demarcated hemorrhages.
Source: PIADC

Classical Swine Fever

Pig, colon. The mucosa is reddened and contains multiple discrete ("button") ulcers surrounded by zones of hemorrhage.
Source: Dr. R. Panciera, Noah’s Arkive, Oklahoma State University
Classical Swine Fever
Pig, inguinal lymph node. There are petechial and peripheral (medullary sinus) hemorrhages.
Source: PIADC

Classical Swine Fever
Pig, lungs. There are numerous disseminated pleural petechiae, and there is mild interlobular edema.
Source: PIADC

Classical Swine Fever
Pig, pharynx and larynx. There are coalescing foci of petechial hemorrhage (and necrosis) in the palatine tonsils and adjacent pharyngeal and laryngeal mucosa.
Source: Dr. W. Wajjwalku, Kasetsart University, Thailand

Classical Swine Fever
Pig, spleen. There are multiple coalescing, swollen dark red infarcts along the margins.
Source: Dr. D. Gregg, Noah’s Arkive, PIADC

Contagious Bovine Pleuropneumonia
Bovine, lung. Most of the pleural surface is covered by abundant fibrin and fibrous tissue.
Source: PIADC

Contagious Bovine Pleuropneumonia
Bovine, pleural cavity. Large sheets of fibrin cover the costal and diaphragmatic pleura, and form pockets containing straw-colored fluid.
Source: PIADC
Contagious Bovine Pleuropneumonia

Bovine, pleural cavity. There is a thick plaque (adhesion) of fibrous tissue on the costal pleura.
Source: PIADC

Contagious Bovine Pleuropneumonia

Bovine, lung. Interlobular septa are markedly thickened by fibrous tissue, and also contain small depressions (air pockets = emphysema).
Source: PIADC

Contagious Bovine Pleuropneumonia

Bovine, lung. Most of the parenchyma is dull and tan (necrotic); partially surrounded by a fibrous capsule, this necrotic zone is termed a sequestrum.
Source: PIADC

Contagious Bovine Pleuropneumonia

Bovine, heart. The pericardial wall is markedly thickened and the pericardial sac contains abundant pale tan, turbid fluid.
Source: PIADC
Contagious Bovine Pleuropneumonia
Bovine, heart. The pericardial sac is distended with abundant turbid, tan fluid, and abundant fibrin coats the pericardial surfaces.
Source: PIADC

Contagious Bovine Pleuropneumonia
Bovine, carpus. The joint capsule and extensor tendon sheath are thickened and contain excessive fluid.
Source: PIADC

Contagious Equine Metritis
Horse, vulva. Mucopurulent exudate drains from the vulva.
Source: PIADC

Contagious Equine Metritis
Horse, vagina. There is straw-colored fluid within the cranial vagina.
Source: PIADC

Contagious Equine Metritis
Horse, uterus. The uterine horns and body are mildly distended (with mucopurulent exudate).
Source: PIADC

Dourine
Horse, rump. Vulvar thickening and edema, often gelatinous, due to Trypanosoma equiperdum.
Source: AFIP
Echinococcosis
Liver. Cross-section of cyst due to echinococcosis.
Source: ISU CVM, VPTH

Echinococcosis
Human, liver. Multiple thin-walled hydatid cysts project from the capsular surface of the liver.
Source: AFIP

Echinococcosis
Skunk, liver. The inner surface of the cyst is lined by hydatid sand and surrounded by a thick capsule of fibrous connective tissue.
Source: ISU CVM

Enterohemorrhagic Escherichia coli
Canine, small intestine. Hemorrhagic enteritis due to E. coli 0157:H7.
Source: AFIP

Epizootic Lymphangitis
Horse, skin. The thoracic (brisket area) skin and subcutaneous tissue are thickened with purulent foci (abscesses).
Source: AFIP

Equine Infectious Anemia
Horse, heart. Pale cardiac muscle, focal white areas of myocardial degeneration, and reddened hemorrhagic areas (possible hypoxia during death).
Source: ISU CVM
**Equine Piroplasmosis**

Horse, heart and lungs. The trachea and pericardial fat are icteric. Lungs are irregularly congested with consolidation of the right cranioventral lung.

Source: AFIP

**Equine Piroplasmosis**

Horse, kidney. The cortex is dark red due to hemoglobinemia; medulla and pelvis are icteric.

Source: AFIP

**Equine Viral Arteritis**

Horse scrotum. Scrotal edema occurring in equine viral arteritis.

Source: Dr. R.C. Giles, University of Kentucky, Noah's Arkive

**Foot and Mouth Disease**

Goat, oral mucosa. There is a large erosion (ruptured vesicle) on the rostral mandibular buccal mucosa.

Source: PIADC

**Foot and Mouth Disease**

Bovine, gingiva. There is an elongate erosion (ruptured vesicle) ventral to the incisors.

Source: PIADC

**Foot and Mouth Disease**

Pig, foot. There is a ruptured vesicle on the caudal-lateral coronary band, with undermining of the heel.

Source: PIADC
Foot and Mouth Disease

Pig, foot. A ruptured vesicle of the coronary band extends into the interdigital skin.
Source: PIADC

Foot and Mouth Disease

Bovine, muzzle. Within the naris, the ventromedial mucosa contains an intact vesicle.
Source: PIADC

Foot and Mouth Disease

Pig, foot. Large clefts at the coronary bands precede sloughing of the claws.
Source: Dr. D. Gregg, Noah’s Arkive, PIADC

Foot and Mouth Disease

Pig, foot. There is an intact vesicle on the caudal coronary band of the left claw, and a cleft (ruptured vesicle) on the heel bulb of the right claw.
Source: PIADC

Foot and Mouth Disease

Bovine, tongue. There are multiple large mucosal erosions and ulcers.
Source: PIADC

Foot and Mouth Disease

Pig, tongue. Many (“dry”) vesicles are ruptured and lack fluid.
Source: Foreign Animal Diseases “The Grey Book” USAHA
**Foot and Mouth Disease**
Rumen mucosa, higher magnification. There are several irregularly shaped erosions (ruptured vesicles) on the pillar.
Source: PIADC

**Foot and Mouth Disease**
Rumen mucosa, dorsal sac, low magnification. There are several erosions (ruptured vesicles) on the pillars. The pale margins are undermined epithelium.
Source: PIADC

**Foot and Mouth Disease**
Bovine teat. There is a ruptured vesicle on the end of the teat.
Source: PIADC

**Foot and Mouth Disease**
Sheep, heart. There is a pale area of myocardial necrosis visible from the epicardial surface.
Source: Dr. D. Gregg, Noah’s Arkive, PIADC

**Fowl Typhoid and Pullorum Disease**
Avian liver, spleen. Liver is pale with diffuse yellow-brown (bronze) discoloration; splenic congestion and enlargement.
Source: Dr. Andreasen, CVM

**Fowl Typhoid and Pullorum Disease**
Avian, abdominal cavity. Liver with focal pale edges (top of abdominal cavity) and enlarged, rounded spleen with white pinpoint multifocal lesions due to *Salmonella gallinarum*.
Source: AFIP
Glanders

Human, skin. There is extensive ulceration and sloughing of the skin of the forearm and hand. Ulcers may be connected by lymphatic vessels ("Farcy pipes") full of thick purulent exudate.
Source: AFIP

Heartwater

Goat. The neck is extended, consistent with dyspnea.
Source: PIADC

Heartwater

Goat, thoracic viscera. There are many pleural hemorrhages, and the lung is moderately noncollapsed (edema).
Source: PIADC

Heartwater

Sheep, lung. Interlobular septa are distended with edema fluid.
Source: PIADC

Heartwater

Sheep, lung. There is severe interlobular edema.
Source: PIADC

Heartwater

Sheep, lung. The lung is noncollapsed and hyperemic, and the bronchi contain frothy fluid (pulmonary edema).
Source: PIADC
Heartwater
Goat, heart. There are many small hemorrhages on the endocardial surface.
Source: PIADC

Heartwater
Goat, precapsular lymph node. There are multiple barely discernable petechiae in the cortex.
Source: PIADC

Heartwater
Small ruminant, abomasum. The mucosa contains disseminated petechial and coalescing ecchymotic hemorrhages.
Source: PIADC

Heartwater
Sheep, kidney. Section reveals numerous fine linear radial hemorrhages; hemorrhages coalesce in the papillae.
Source: PIADC

Heartwater
Goat, abomasum. There are multiple petechial and paintbrush serosal hemorrhages.
Source: PIADC

Heartwater
Small ruminant, small intestine. The mucosa contains numerous petechiae and ecchymoses.
Source: PIADC
Heartwater
Sheep, brain. The leptomeninges are congested and contain many small hemorrhages. Gyri are flattened (cerebral edema).
Source: PIADC

Heartwater
Goat, brain. The cerebrum contains multiple petechiae and a few ecchymoses. The swollen, hemorrhagic choroid plexus protrudes from the lateral ventricle.
Source: PIADC

Heartwater
Goat, brain smear. An endothelial cell contains a morula (cluster) of *Ehrlichia ruminantium*.
Source: PIADC

Heartwater
Goat, peripheral blood smear. A neutrophil contains a few *Ehrlichia ruminantium*.
Source: PIADC

Heartwater
Goat, buffy coat smear. Several neutrophils contain *E. ruminantium* morulae.
Source: PIADC

Hemorrhagic Septicemia
Bovine, heart. There are numerous often coalescing petechiae on the epicardium.
Source: PIADC
Hemorrhagic Septicemia

Bovine, submandibular region. There is severe subcutaneous/facial edema and multifocal hemorrhage. The parotid gland exhibits interlobular edema.
Source: PIADC

Influenza

Pig, lungs. There is diffuse tan consolidation of cranial lobes, and multifocal lobular consolidation of the caudal lobes.
Source: Dr. B. Janke, ISU CVM, VDL

Japanese Encephalitis

Pig, feruses. The litter consists of five large (full-term) stillborn fetuses and two small mummified fetuses.
Source: Dr. K. Kawashima, Central Livestock Hygiene Service Center Saitama pref., Japan

Leishmaniasis

Dog, bone marrow. The bone marrow contains hematopoietic precursors and macrophages with numerous intracytoplasmic Leishmania sp.
Source: Dr. C. Andreasen, ISU CVM, VPTH

Leishmaniasis

Dog, bone marrow. Higher magnification of bone marrow demonstrating intracellular and extracellular Leishmania sp.
Source: Dr. C. Andreasen, ISU CVM, VPTH

Hendra

Horse, lung. There is severe interlobular edema.
Source: Dr. M. Williamson, CSIRO, Australia
Louping III
Sheep. Sheep with neurologic deficits that is unable to stand.
Source: AFIP

Lumpy Skin Disease
Bovine, skin. There is hemorrhagic exudate subjacent to the necrotic center (siftasts) of a papule.
Source: Noah's Arkive, PIADC

Lumpy Skin Disease
Bovine, muzzle. There are multiple sharply-demarcated slightly raised papules, often with eroded surfaces, that extend into the nares.
Source: Noah's Arkive, PIADC

Lumpy Skin Disease
Bovine, nasal turbinate. Early pox lesions are slightly pale round foci rimmed by petechiae.
Source: PIADC
Lumpy Skin Disease
Bovine, nasal turbinate. The centers of well-developed pox are necrotic.
Source: PIADC

Lumpy Skin Disease
Bovine, trachea. The mucosa contains a poorly demarcated round focus rimmed by mild hemorrhage (early pox lesion).
Source: PIADC

Lumpy Skin Disease
Bovine, lung. There is marked generalized interlobular edema, and there is a small cluster of red nodules on the left side of the specimen.
Source: Noah's Arkive, PIADC

Maedi-Visna
Sheep, lung. Lung fails to deflate and contains coalescing multifocal gray-white nodules/plaques (proliferative lymphocytes and pneumocytes) with adjacent atelectatic depressed parenchyma (red-pink).
Source: AFIP

Maedi-Visna
Sheep, lung. Lung fails to deflate with pale gray coalescing proliferative areas and cranioventral atelectasis (reddish area).
Source: AFIP

Malignant Catarrhal Fever
Bovine, muzzle. Multiple shallow erosions are filled with dried nasal exudate.
Source: PIADC
Malignant Catarrhal Fever
Bovine. There is diffuse superficial necrosis of the muzzle.
Source: PIADC

Malignant Catarrhal Fever
Bovine, hard palate. There are multiple coalescing mucosal erosions.
Source: PIADC

Malignant Catarrhal Fever
Bovine, head, sagittal section. Mucoid exudate multifocally covers the nasal and pharyngeal mucosa.
Source: PIADC

Malignant Catarrhal Fever
Bovine, oral mucosa. There is gingival hyperemia and focal erosion.
Source: PIADC

Malignant Catarrhal Fever
Bovine, skin. There are numerous raised plaques (multifocal dermatitis).
Source: PIADC

Malignant Catarrhal Fever
Bovine, nasal turbinate. There is a small amount of mucoid exudate.
Source: PIADC
Malignant Catarrhal Fever
Bovine, prescapular lymph nodes: Moderately (left) to markedly enlarged (right) due to MCF.
Source: PIADC

Malignant Catarrhal Fever
Bovine, omasum. Omasal leaves contain multiple pale foci of necrosis; on the right there are several ulcers.
Source: PIADC

Malignant Catarrhal Fever
Bovine, prescapular lymph node. There are foci of hemorrhage (and necrosis) in the cortex, and the medulla is edematous.
Source: PIADC

Malignant Catarrhal Fever
Bovine, spiral colon. There are multiple mucosal hemorrhages.
Source: PIADC

Malignant Catarrhal Fever
Bovine, cecum and ileum. There are scattered small foci of mucosal hemorrhage and erosion.
Source: PIADC

Malignant Catarrhal Fever
Bovine, colon. There is severe longitudinal linear congestion of the mucosa.
Source: PIADC
Malignant Catarrhal Fever
Bovine, kidney. Multiple pale foci in the cortex are foci of interstitial nephritis.
Source: PIADC

Malignant Catarrhal Fever
Bovine, urinary bladder. The mucosal surface contains several small erosions and one large hemorrhagic ulcer.
Source: PIADC

Melioidosis
Goat, nasal turbinates. There are multiple raised pale nodules (abscesses) on the nasal mucosa.
Source: Dr. K. Kawashima, National Institute of Animal Health, Japan

Monkeypox
Rhesus macaque, monkeypox. There are multiple hemorrhagic papules on the forehead and eyelids.
Source: AFIP

Monkeypox
Primate, hindlimb, monkeypox. There are numerous discrete papules with red, depressed centers.
Source: AFIP

Mycoplasmosis, Avian
Turkey, head. Purulent sinusitis.
Source: Dr. N. Cheville, ISU CVM.
Newcastle Disease

Chicken, comb. The comb is markedly edematous and contains multiple foci of hemorrhage.
Source: PIADC

Newcastle Disease

Chicken, eye. Conjunctival hemorrhage is most severe in the nictitans.
Source: CAHFSLS

Newcastle Disease

Chicken, trachea. Tracheal and laryngeal mucosa contain many foci of hemorrhage and small clumps of fibrinonecrotic exudate.
Source: CAHFSLS

Newcastle Disease

Chicken, oral cavity. Numerous clumps of fibrinonecrotic exudate adhere to foci of necrosis in the oral, pharyngeal, and esophageal mucosa.
Source: CAHFSLS

Newcastle Disease

Chicken, subcutis. There is marked subcutaneous edema in the neck, extending to the thoracic inlet.
Source: CAHFSLS
Newcastle Disease
Chicken, ceca. Hyperemic, necrotic cecal tonsils are visible from the serosal surface.
Source: CAHFSLS

Newcastle Disease
Chicken, ceca. The cecal tonsil is red-brown, thickened, and friable (necrotic).
Source: CAHFSLS

Newcastle Disease
Chicken, rectum. There are multiple linear mucosal hemorrhages.
Source: CAHFSLS

Newcastle Disease
Chicken, colon. The mucosa contains multiple sharply demarcated foci of hemorrhage and necrosis.
Source: CAHFSLS

Newcastle Disease
Chicken, proventriculus. The proximal mucosa is eroded and covered by a fibrinonecrotic (diphtheritic) membrane.
Source: CAHFSLS

Newcastle Disease
Chicken, cecal tonsil necrosis.
Source: CAHFSLS
Ovine Pulmonary Adenocarcinoma (Adenomatosis)

Sheep, lung. The lungs fail to deflate and are mottled with coalescing to diffuse proliferative areas (pale pink) with red areas of atelectasis.
Source: Dr. C. Clarke, University of Edinburgh, Noah's Arkive.

Ovine Pulmonary Adenocarcinoma (Adenomatosis)

Sheep, lung. The cut surface of the lung has large, firm, gray coalescing proliferative and fibrotic masses that are sharply demarcated.
Source: Dr. C. von Tscharner, Institute of Animal Pathology, Vetsuisse Faculty, University of Bern, Switzerland, Noah's Arkive.

Plague

Primate, liver. The liver has multifocal to coalescing white lesions due to *Yersinia pestis*.
Source: AFIP

Paratuberculosis

Sheep, intestine. The mucosal surface of the intestine contains a roughened cobblestone appearance due to granulomatous infiltrates.
Source: AFIP

Q Fever

Goat, placenta. The intercotyledonary placenta is thickened, opaque, and multifocally covered by tan exudate. Margins of several cotyledons are tan (necrosis), and centers are mottled red-brown (congestion and exudation).
Source: Dr. J. Arzt, PIADC
Rabbit Hemorrhagic Disease

Rabbit, severe epistaxis.
Source: Dr. J.P. Teifke, Federal Research Institute for Animal Health Riems, Germany

Rabbit Hemorrhagic Disease

Rabbit, liver. There is a large area of pallor (necrosis) with a prominent reticular pattern.
Source: Dr. J.P. Teifke, Federal Research Institute for Animal Health Riems, Germany

Rabbit Hemorrhagic Disease

Rabbit, heart. There are multiple epicardial hemorrhages.
Source: Dr. J.P. Teifke, Federal Research Institute for Animal Health Riems, Germany

Rabbit Hemorrhagic Disease

Rabbit, spleen. The spleen is markedly enlarged and congested.
Source: Dr. J.P. Teifke, Federal Research Institute for Animal Health Riems, Germany
Rabbit Hemorrhagic Disease

Rabbit, kidney. There are petechiae throughout the cortex, and the medulla is severely congested.
Source: Dr. J.P. Trifke, Federal Research Institute for Animal Health Riems, Germany

Rift Valley Fever

Sheep, fetus. Both the pleural and peritoneal cavities contain excessive clear, straw-colored fluid.
Source: PIADC

Rift Valley Fever

Sheep, heart. The ventricular endocardium contains many hemorrhages.
Source: PIADC

Rift Valley Fever

Sheep, liver. The cut surface of this swollen liver is pale and contains many petechiae.
Source: PIADC

Rift Valley Fever

Sheep, fetus, kidney. There is severe perirenal edema.
Source: PIADC

Rift Valley Fever

Bovine, fetus. The skin of this emphysematous fetus is stained with meconium.
Source: PIADC
Rift Valley Fever
Sheep, colon. There is severe locally extensive mucosal hemorrhage.
Source: PIADC

Rinderpest
Bovine, oral mucosa. There are numerous small gingival erosions.
Source: PIADC

Rinderpest
Bovine, oral mucosa. There are numerous coalescing erosions on and between the buccal papillae.
Source: PIADC

Rinderpest
Bovine, oral mucosa. There is severe diffuse necrosis/coalescing ulceration of the dental pad; mandibular mucosa contains smaller erosions.
Source: PIADC

Rinderpest
Bovine, hard palate. The mucosa contains many small, coalescing, pale to dark red erosions or foci of necrosis.
Source: PIADC
Rinderpest

Bovine, trachea. The mucosa is hyperemic and covered by abundant mucopurulent exudate.
Source: PIADC

Rinderpest

Bovine, colon. There are many petechiae on the crests of the mucosal folds, and there are several small blood clots on the mucosal surface.
Source: PIADC

Rinderpest

Bovine, colon. The mucosa contains multiple longitudinal linear hemorrhages.
Source: PIADC

Rinderpest

Bovine, ileum. The mucosa is hemorrhagic and edematous, and the Peyer's patch is depressed (necrosis).
Source: PIADC

Rinderpest

Bovine, ileum. Peyer's patches are depressed and covered by fibronecrotic exudate.
Source: PIADC

Screwworm Myiasis

Screwworm. Third instar screwworm larvae have dark tracheal tubes.
Source: Foreign Animal Diseases "The Grey Book" USAHA
**Screwworm Myiasis**
Screwworm fly. The head of the adult fly is red-orange.
Source: Foreign Animal Diseases "The Grey Book" USAHA

**Sheep Pox and Goat Pox**
Sheep, inguinal skin. Several coalescing macules contain petechiae.
Source: PIADC

Sheep, scrotum and inguinal skin. There are multiple red brown papules. There are two hemorrhagic ulcers on the medial aspect of the stifle.
Source: PIADC

Sheep, subcutis. There are numerous hemorrhages, and several dark red round foci of hemorrhage and necrosis (beneath cutaneous pox).
Source: PIADC

Goat. Two pox on the ventral tail have dessicated, dark red, undermined (necrotic and sloughing) centers.
Source: PIADC
Sheep Pox and Goat Pox

Goat, udder. The skin contains two sharply demarcated necrotic foci (subacute pox).
Source: PIADC

Sheep Pox and Goat Pox

Sheep, skin. Several coalescing pox have pale tan (necrotic) centers.
Source: PIADC

Sheep Pox and Goat Pox

Goat, muzzle. The muzzle contains several papules and is partially covered by hemorrhagic nasal exudate.
Source: PIADC

Sheep Pox and Goat Pox

Small ruminant, lung. There are numerous, small, coalescing, red-tan, consolidated foci (pneumonia).
Source: PIADC

Sheep Pox and Goat Pox

Goat, skin. There are multiple coalescing papules (pox) that often have tan, dry (necrotic) centers.
Source: PIADC

Sheep Pox and Goat Pox

Small ruminant, lungs. The lungs contain multiple discrete tan to red-brown nodules (multifocal interstitial pneumonia). Mediastinal lymph nodes are enlarged.
Source: PIADC
Sheep Pox and Goat Pox
Small ruminant, lung. There are numerous raised pale nodules (multifocal pneumonia).
Source: PIADC

Sheep Pox and Goat Pox
Small ruminant, lung. There are multiple discrete, round, red-brown foci of consolidation (pneumonia).
Source: PIADC

Sheep Pox and Goat Pox
Small ruminant, uterus. The endometrium contains several tan papules (pox) among the caruncles.
Source: PIADC

Sheep Pox and Goat Pox
Goat, lung. There are multiple coalescing tan foci of consolidation (pneumonia), and the adjacent lymph node is markedly enlarged.
Source: PIADC

Sheep Pox and Goat Pox
Small ruminant, lung. There are numerous raised pale nodules (multifocal pneumonia).
Source: PIADC

Swine Vesicular Disease
Pig, skin. There isa deep ulcer on the dorsum of the snout.
Source: ISU CVM
Swine Vesicular Disease
Pig, foot. There are multiple large erosions/ulcers of the coronary bands.
Source: PIADC

Swine Vesicular Disease
Pig, foot. The wall of the dewclaw is undermined adjacent to an ulcer at the coronary band.
Source: PIADC

Theileriosis
Bovine, lung. The lung tissue is diffusely tan-brown, and lobules are noncollapsed and rubbery (interstitial pneumonia).
Source: PIADC

Theileriosis
Bovine, lung. Lung tissue is noncollapsed, contains multiple foci of hemorrhage, and there is fluid/foam within bronchi and interlobular septa.
Source: PIADC
Theileriosis
Bovine, popliteal lymph node. The node is enlarged and diffusely pale, and contains numerous petechiae.
Source: PIADC

Theileriosis
Bovine lymphoblasts contain intracytoplasmic *Theileria parva*.
Source: PIADC

Theileriosis
Bovine, kidney. There are multiple petechiae on the surface of the cortex. The lymph node near the hilus is markedly enlarged.
Source: PIADC

Ticks (exotic)
*Rhipicephalus appendiculatus* - Tick, arthropod. Brown ear tick and vector of theileriosis.
Source: PIADC

Ticks (exotic)
*Rhipicephalus annulatus* - Cattle tick, arthropod. Known to transmit babesiosis and anaplasmosis.
Source: AFIP

Ticks (exotic)
*Ammobynx variegatum* - Ticks, skin. Ticks feeding on goat skin. Can transmit the agent of heartwater (*Ehrlichia ruminantium*).
Source: PIADC
Ticks (exotic)

*Rhipicephalus microplus* - Tick, arthropod. Known to transmit babesiosis and anaplasmosis.
Source: Dr. J. Ostojic, ISU, CVM, VPTH

Transmissible Spongiform Encephalopathies

Brain. The red box indicates the region of the obex, the portion of the brainstem that is required for TSE diagnosis.
Source: Dr. S. Sorden, ISU CVM, VPTH

Trypanosomiasis, American (Chaga's Disease)

Dog, heart. There are multiple white linear streaks on the surface of the right and left ventricles corresponding to myocardial necrosis and myocarditis.
Source: Dr. S. Barr, Cornell University, CVM, Dept of Clinical Sciences

Trypanosomiasis, African

Horse, kidney. Cortex is pale and there are multiple petechial hemorrhages at the corticomedullary junction.
Source: AFIP

Tularemia

Beaver, liver. There are disseminated small pale foci of necrotizing hepatitis.
Source: Dr. G. Wobeser, CCWHC
**Tularemia**
Cat, lung. Numerous <1 mm diameter pale foci are disseminated throughout all lung lobes.
Source: Dr. J. Nierfeld, KSU CVM

**Vesicular Stomatitis**
Horse, mouth. There is extensive erosion of the lips at the mucocutaneous junction.
Source: ISU CVM

**Tularemia**
Cat, spleen and liver. Numerous ~1 mm diameter pale foci are disseminated throughout the spleen; fewer pale foci are discernible in the liver lobe.
Source: Dr. J. Nierfeld, KSU CVM

**Vesicular Stomatitis**
Bovine, mouth. There is extensive ulceration of the dental pad, and severe salivation.
Source: ISU CVM

**Vesicular Stomatitis**
Pig, skin. There is a large vesicle (bulla) on the dorsal snout.
Source: ISU CVM

**Vesicular Stomatitis**
Bovine, mammary gland. The distal teat is severely eroded and hemorrhagic.
Source: ISU CVM
Vesicular Stomatitis

Bovine, foot. The coronary band at the heels is thickened, multifocally eroded, and covered by dried necrotic exudate.

Source: PIADC.

Viral Hemorrhagic Septicemia

Fish, whole body. The external surface of the fish (gizzard shad) contains numerous ecchymotic hemorrhages.

Credit: Dr. P. Bowser, Aquatic Animal Health Program, CVM, Cornell University