

Affections Of Specific Parts and Organs of Food Animals

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Glossary

Causative agent	The organism or factor responsible for causing the disease.
Judgment	The decision taken by an inspector, based on ante and post-mortem inspection.
Emaciation	Extreme weight loss and muscle wasting.
Localized	Disease limited to a specific region without systemic signs.
Generalized	Disease spread throughout the body with systemic signs.
Approved for human consumption	Meat that has been inspected and passed without any restrictions
Carcass	The body of any slaughtered animals after bleeding and dressing
Meat	The edible part of any mammal slaughtered in an abattoir.
Condemned	Meat that has been inspected and judged as unfit for human consumption
Total condemnation	If the entire carcass and offal are condemned.
Partial condemnation	If only parts of the slaughtered animal are condemned, while others are judged otherwise
Approved for distribution in restricted areas	Meat that has been inspected and approved for human consumption with the requirement that the distribution shall be limited to restricted area.
Conditionally approved for human consumption	Meat that has been inspected and approved for human consumption after certain treatments (freezing , boiling , steaming , pickling)
Offal	Any edible or non-edible part of the animal other than carcass

Scope

This document provides a practical reference for veterinary meat inspectors. It lists common diseases and affections found in food-producing animals during post-mortem inspection, organized by anatomical region or organ. For each affection, the causative agent and the recommended judgment are summarized in accordance with standard meat hygiene practices.

I. Affections of the Skin

1. Dermatitis

Causative agent: Infectious, allergic, nutritional, or parasitic.

Judgment: Case-dependent.

2. Sheep and Swine pox

Causative agent: Poxvirus

Judgment: With fever: Total condemnation; Without: Condemn affected parts.

3. Lumpy Skin Disease

Lumpy skin disease is highly infectious viral disease of cattle characterized by the presence of firm nodules in the skin, lung, digestive and reproductive tracts accompanied by fever and lymphangitis. The nodules may be ruptured leaving ulcers or become indurated..

Causative agent: Mild form of herpes virus.

Appearance :Thickening of the skin with red raised spots become scabs.

Judgment :As in pox, or Removal of affected parts with heat treatment of carcass and viscera.



Lumpy Skin Disease " Buffalo Calf"



Lumpy Skin Disease " Bull"

Fig. 2

Fig. 1

4. Mange

Causative agent: Parasites.

Appearance: Thickening of skin with red raised spots become scabs.

Judgment: In **cattle and sheep**, condemn the carcass if there is emaciation, while if there is no emaciation, condemn the skin only / In **swine** stripping of affected skin.

Fig. 3.
Severe crusting lesions caused by psoroptic mange in a bull



Fig. 4.
Mange at the trailhead of a dairy cow causing scaling, itching and hair loss



5. Wounds and Injuries

Causative agent: Trauma, diseases.

Appearance: May be local lesions or multiple.

Judgment: Total condemnation in the presence of systemic disturbances. / Condemnation of affected parts in absence of systemic disturbances.



Fig. 5 Fracture



Fig. 6 Wound

6. Tumors

As papilloma, melanoma, squamous cell carcinoma.

Appearance: May be benign or malignant

Judgment:

- Total condemnation in malignant tumors.
- Condemnation of affected parts in benign tumors.



Fig. 7 Squamous cell carcinoma



Fig. 8 Squamous cell carcinoma

7. Skin tuberculosis

Causative agent: Mycobacterium tuberculosis.

Appearance:

- Hard painless nodules up to hen's egg. Subcutaneous or intra-dermal of to lymphatic vessels.
- Lesions are found in limbs, fore arm, rarely on chest and shoulders. On section fibrous wall enclosing a caseo-calcareous center or thick yellow gelatinous pus or dried material like powder maize.

Judgment:

- Total condemnation in case of generalization, or localization and emaciation.
- Condemnation of skin in case of localized affection.

8. Acute skin congestion

Acute skin congestion in the pig may be widespread or localized. As in; swine fever, swine erysipelas, urticaria, pig paratyphoid.

9. Transit erythema

Affects pig on long rail journeys in the form of red patches on the skin in contact with floor due to irritant effect of disinfectant and urine on the floor. The condition is localized and the affected areas should be condemned. In severe cases extravasations of blood into the subcutaneous fat occur which only required removal of all colored fatty tissues. While in very severe cases there is congestion of the lymph nodes and fevered appearance of the carcass, which required total condemnation.

10. Foot and Mouth Disease

The lesions appear on the lips, muzzle or on the skin of the hoofs in the form of vesicles between the clefts of the feet, on the heel near the digits and / or around the coronet.



Fig. 9 Hoof ulcer



Interdigital Space Ulcer + Vesicle FMD

Fig. 10

11. Ring worm

Ringworm is a common skin lesion affection but of no significance in meat inspection

12. Contagious foot rot 'Foul of the foot', Interdigital necrobacillosis "

Foot rot is an infectious disease of cattle associated with *Sphaerophorus necrophorus*. One or more of the feet may be involved with inflammation and necrosis at the top of the interdigital clefts. In acute stage there is edema and hyperemia of the affected part. In early stages there is sever lameness often with fever and loss of condition. In sheep the condition may be seen around the coronet and may cause emaciation. In local condition the carcass approved for food after condemnation of the affected part.

13. Contagious pustule dermatitis "ORF"

ORF is a highly contagious viral disease of sheep and appears in the form of papule, vesicle, pustule and crust chiefly involving lips and feet. It is a local condition necessitating condemnation of the affected parts, but care should be taken in handling of the infected material, as the disease is transmissible to man.

14. Warble fly

The ox hide may be damaged by the warble fly larvae or ticks bites. These bites may be left a white spots on the skin after tanning.

II. Affections of the Head and Tongue

1. Cattle plague

Acute febrile infectious viral disease characterized by the presence of diphtheritic inflammation with cheese like deposits in the mouth and pharynx.

Free area: Total condemnation. (Diseased and contact animals).

Enzootic area: Condemnation of the viscera with heat treatment of the carcass and distribution in limited area.

2. Calf diphtheria:

The lesions in the form of diphtheritic patches and ulceration on tongue, mouth, pharynx or gums. These lesions appear as grey necrotic areas, which can only be scraped or peeled off with difficulty.

Localized: Heat treatment of the carcass after condemnation of the head.

Generalized: Total condemnation due to fever and emaciation.

3. Haemorrhagic septicemia

The disease occur in two forms:

- **Skin form** which showed fever, marked swelling of the head, neck, throat and dewlap with the adjacent lymph nodes are enlarged and may be petechial hemorrhages.
- **Pectoral form**, which is characterized by high fever, petechial, hemorrhages in the serous and mucous membranes as well as all the organs. It show marked pneumonia. In both forms hemorrhagic enteritis is evident.

Judgment: Total condemnation

4. Actinobacillosis “Wooden tongue”

Actinobacillosis is a chronic granulomatous disease of the soft tissues (tongue, skin, and parenchymatous organs) of cattle and pig. *Actinobacillus lignireesi* is the main cause of the disease. The lesions in the tongue and muscles are associated with the lesions in the associated lymph nodes. The lymph node lesions are convex with small yellowish glistening nodules embedded in fibrous connective tissue and arranged characteristically in the peripheral portion of the cortex in irregular clusters toward one end of the node. The tongue showed enlargement and hardening.

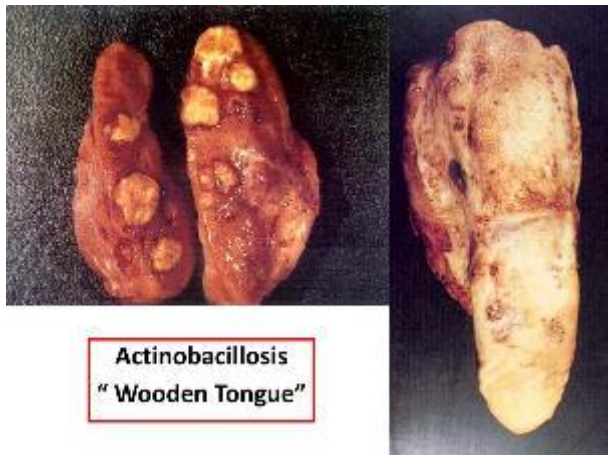
Localized: Condemnation of head, Condemnation of liver, lung, stomach, peritoneum and shoulder if affected.

Generalized: Total condemnation due to fever and ill bleeding.



Actinobacillosis
" Wooden Tongue"

Fig. 11



Actinobacillosis
" Wooden Tongue"

Fig. 12

5. Actinomycosis "Lumpy jaw"

Actinomycosis is a chronic suppurative disease of bone tissue of cattle and udder tissue of pig. The lesions are usually confined to the head and involved the jaw bones to produce "Lumpy Jaw". The lower jaw is more affected than the upper one. The bone being thickened and presenting a bony combed appearance with small abscesses and suppuration tracts and fistulae on section.

In cattle: Condemnation of head and the carcass approved.

In Saw: Condemnation of udder and the carcass approved.



Bovine Head Actinomycosis " lumpy jaw"

Fig. 13



Bovine Head Actinomycosis " lumpy jaw"

Fig. 14

6. Tuberculosis

The common lesions of tuberculosis in the bovine head are mainly in the retropharyngeal lymph node while in pig the sub maxillary nodes are commonly affected.

Localized: Without emaciation, condemnation of the head / with emaciation total
 Condemnation

Generalized: Total condemnation.

Fig. 15 TB nodules in Ln.



7. Parasitic Cysticerci

Pig	<i>C. cellulose</i>	Total condemnation even if one cyst present
Sheep	<i>C. ovis</i>	Condemnation of the cyst
Camel	<i>C. cameli</i>	Condemnation of the cyst
Cattle	<i>C. bovis</i>	
	<ul style="list-style-type: none"> • In heavy infestation "More than one cyst living or dead at an area in the size of hand palm in different cuts of the carcass": total condemnation of the carcass • In light infestation "Not heavy": Conditionally approved by: <ul style="list-style-type: none"> ○ Freezing at -10°C for 10 days (<i>C. bovis</i> die at -3°C for 24 hour) ○ Boiling for 2.5 hours (cut 5 lb. and 10 cm thickness, <i>C. bovis</i> die at 49°C). ○ Steaming at 80°C and 0.5 atmospheric pressure for 10 minutes ○ Pickling in 25% brine solution for 25 days. <p>Cattle: <i>C. bovis</i> may be found in masseter muscle, tongue <i>Oestrus bovis</i>. Pig: <i>C. cellulose</i>. Sheep: <i>C. ovis</i>, <i>Coenuris cerebralis</i>, <i>Oestrus ovis</i>. Camel: <i>C. dromedarii</i>, <i>C. bovis</i>, <i>C. ovis</i>.</p>	



Bovine head & heart "multiple *C.bovis*"

Fig. 17

Fig. 16 . .C. bovis in tongue



Goat head masseter muscle with multiple C.ovis

Fig. 18

8. Foot and Mouth Disease (FMD)

The vesicular lesions are found on the tongue, lips and dental pad. The vesicles eventually ruptured leaving red painful erosions. In sheep the vesicles are much smaller than in the cattle.

Causative agent: Aphthovirus

Judgment: Free countries: Total condemnation. Enzootic countries: When slaughter of contact is practicable, diseased animal showed fever (T), and those which show no fever and contacts (Kh+ D) When immediate slaughter is not economic, diseased animal (T), contact and recovered 3 months after last case or vaccination (L + D).

NB: **D** = partial condemnation of the head, feet, pharynx, esophagus, testicles, udder and bones



Bovine head "ulcer" FMD Tongue + Dental Pad

Fig. 19



Bovine Tongue "ulcer" FMD

Fig. 20



Bovine Tongue "ulcer" FMD

Fig. 21



Lower Jaw "ulcer" FMD

Fig. 22

9. Blue tongue

Blue tongue is an infectious viral disease of sheep and pigs characterized by stomatitis and severe loss of condition. The mouth lesions vary from superficial inflammation to ulcers, erosions and necrosis of the buccal mucosa. The tongue is swollen and cyanosed. Acute cases with widespread lesions necessitate total condemnation of the carcass.

Causative agent: Orbivirus

Judgment: Acute with widespread lesions: Total condemnation.



Fig. 23 Cyanosed ovine tongue



Fig. 24 Cyanosed ovine tongue

10. Ulcers

Ulcers may be of varying size and may be seen in actinobacillosis and FMD.

Causative agent: Various (e.g., FMD, actinobacillosis etc.)

Judgment: Based on primary cause

11. Pharyngeal abscesses

Pharyngeal abscesses in pig and sheep are generally traumatic in origin caused by swallowing of sharp objects.

Causative agent: Traumatic origin

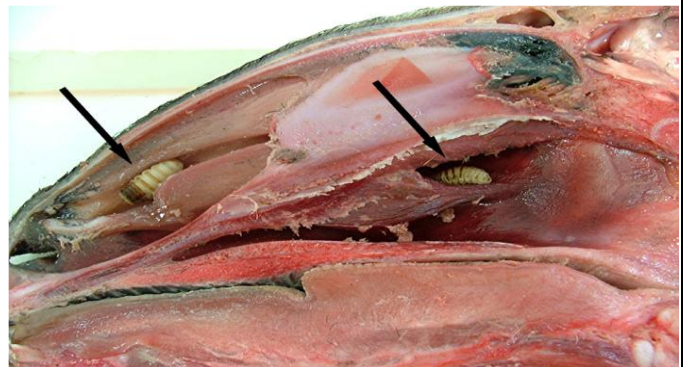
Judgment: Condemn head.

12. *Oestrus ovis*

Causative agent: also known as the sheep nasal bot, is a fly approximately 10mm in length whose larval stage is parasitic in the nasal passages of sheep. The female adult fly is viviparous, the young hatching within the adult who then squirts fluid containing approximately 15-20 first stage larvae (L1) at the muzzle of the animal. The L1 larvae, approximately 1mm in length then migrates through the nostrils to the frontal sinuses where they feed on the mucoid secretion stimulated by their presence. After the first moult the L2 larvae crawl into the frontal passages where the second moult to the L3 larvae occurs.

Judgment: Condemn of head.

Fig. 24-a *Oestrus ovis*

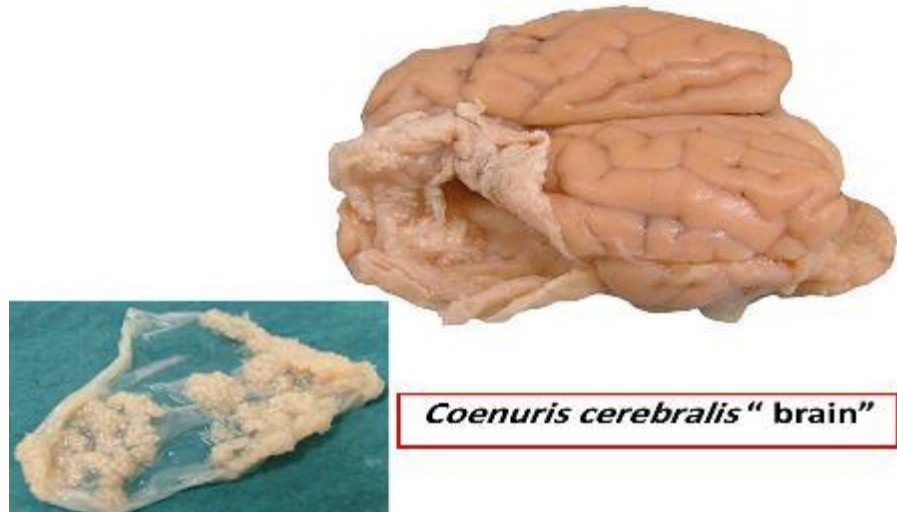


13. Coenuriosis (*Coenurus cerebralis*)

Causative agent: Also known as 'gid' and 'sturdy', coenuriosis is a condition of sheep caused by the presence of the migrating larvae and metacestode stage of the canine tapeworm *Taenia coenurus* (*T. multiceps*) of the central nervous system. In canines the adult tapeworm is 40-100cm in length .

Judgment: Condemn of head.

Fig. 24-b



III. Affections of the Liver

A- Pathological affections

1. Degeneration:

Animal suffers from acute infectious disease, the liver is the first organ undergoes macroscopic changes. These changes are manifested by cloudy swelling and or pathological fatty change.

Organ: Condemn the affected organ.

Carcass: Total condemnation of carcass showed systemic reactions. (Fever, septicemia, pyaemia). Normal carcass approved.



Cloudy swelling and Fibrosis sheep liver



Pork Liver Fatty change

Fig. 26

Fig. 25

2. Acute toxic hepatitis

In which there is fatty changes and necrosis of the liver cells. It is caused by chemical poisoning (arsenic, copper, and phosphorus), plant (mycotoxins) and toxemia (bacterial and viral diseases).

Causative agent: Chemical poisoning (arsenic, copper, phosphorus), plant toxins, toxemia
Judgment: Same as degeneration.

Fig. 27



Bovine Liver "Hepatitis"

3. Cavernous-haemangioma "Telangiectasis" 'Plum pudding liver'

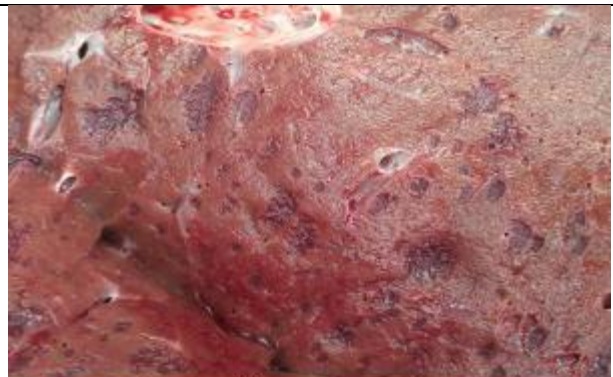
It is a common affection in imported animals. The cause is not well known but feeding factor and *Sphaerophorus necrophorus* may be concerned. On the other hand the lesion may have neurogenic origin caused by stretching of the spinal nerves, which may cause vasodilatation of the blood vessels of the liver. It is more common in intensive fed animals. Bluish black areas beneath the capsule and throughout the parenchyma characterize it. Lesions consist of dilated blood capillaries filled with blood.

Causative agent: Unknown; possibly *Sphaerophorus necrophorus*, neurogenic, or nutritional
Judgment: Organ: Slightly affected – approved; severely affected – condemn.
Carcass: Approved.

Fig. 28



Bovine Liver "Cavernus Hemangioma"
(Telangiectasis)



Bovine Liver "Cavernus Hemangioma"
(Telangiectasis)

Fig. 29

4. Fatty liver

Fatty liver is due to the mobilization of lipids from extrahepatic sources and from increased synthesis of lipids in the liver itself. The condition commonly seen in well-nourished lambs and very fatty aged cows. Affected liver is larger and heavier than normal. The liver edges are rounded, yellow or yellowish brown in color & soft in consistency.

Affected liver is fit for food, but the changes in color and consistency may make it unmarketable.

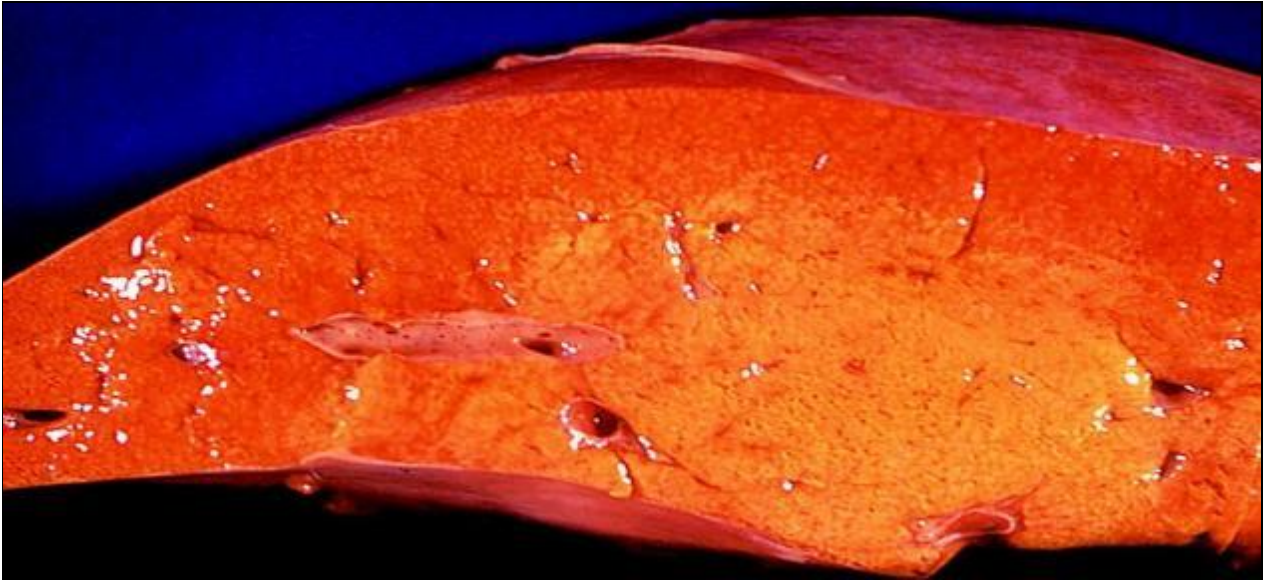


Fig. 30 Bovine fatty liver

5. Liver Enlargement

Causative agent: Fatty infiltration, cirrhosis, abscess, tumor, plant poisoning.

Judgment: Case-dependent.

6. Rupture of Liver

Causative agent: Trauma, tumors, cysts, fascioliasis

Judgment: Condemn affected organ.

7. Adenoma

Causative agent: Benign tumor.

Judgment: Condemn organ and its lymph nodes.

8. Leukemia

The liver enlarged with proliferation of its interlobular connective tissue.

Causative agent: Neoplastic proliferation.

Judgment: Total condemnation.

9. White liver disease

The condition occurs in sheep where the liver is enlarged and shows fatty changes. It is usually associated with cobalt /vitamin B12 deficiency, pregnancy toxemia in ewes and poor nutrition of cows in late pregnancy.

Causative agent: Cobalt/vitamin B12 deficiency.

Judgment: Condemn affected liver.

10. Black Liver

Causative agent: It is due to presence of the pigment lipofuscin from feeding on leaves of the mulga tree.

Judgment: Condemn affected liver.

11. Saw dust liver

The liver showed minute yellowish necrotic foci scattered throughout the substance and surface of the liver of young fatty cattle. It believed to be either early abscesses or the result of vit. E deficiency. Affected liver must be condemned.

B- Bacterial affections of the liver:

1. Tuberculosis

Tuberculosis of cattle and pig is common, while that of sheep and camel is rare. Congenital TB occurs in calves less than 2 weeks old.

Causative agent: Mycobacterium spp.

Judgment:

Localized: Condemnation of liver and its lymph nodes

Localized and emaciation: Total condemnation

Generalized: Total condemnation

2. Liver Abscess

Liver abscess may occurs in young cattle due to umbilical infection while in older one, liver abscess may occur due to pyaemia, penetration of foreign body from reticulum or fasciola encysted metacercaria with pyaemic microorganisms from gastrointestinal tract.

Judgment: Small: Remove abscess / **Multiple:** Condemn the liver.

Carcass: Total condemnation if there is systemic disturbance; otherwise, bacteriological examination of the affected carcass.

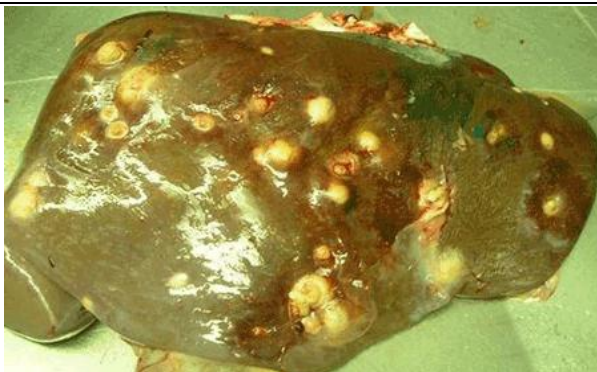


Fig. 31 Ovine liver " Multiple abscesses "

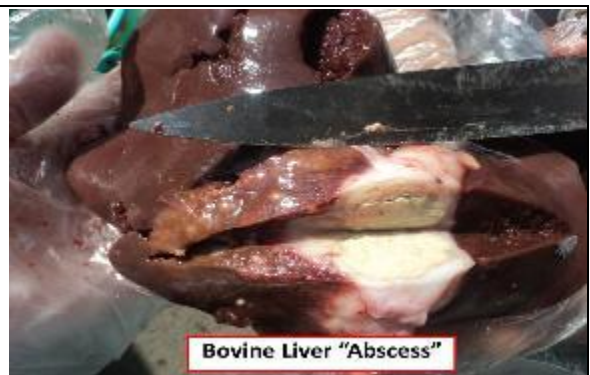


Fig.32

3. Focal necrosis 'Bacterial necrosis'

Occur in sheep and cattle but rare in pig and camel. It is caused by *Serophilous necrophorus* which inhabitant intestinal tract of herbivores. The microorganisms penetrate the intestinal wall

to reach the liver through portal vein. In acute cases the liver enlarged with formation of numerous necrotic foci and fever, while in chronic form necrotic foci with coagulated material.

Judgment: Localized: Condemn affected part / **Heavy:** Condemn the liver.

Carcass: Approved if normal, total condemnation if there is fever or jaundice.

Fig.33



Focal necrosis sheep liver

C-Parasitic affections of the liver:

1. Fascioliasis

It is a common affection in the liver of cattle and sheep.

In acute stage, the liver is congested and swollen with petechial hemorrhages under the capsule.

In chronic stage: cirrhosis and formation of connective tissue in the wall of the bile ducts and the surrounding liver tissues. In cattle the bile ducts become calcareous or pipes due to deposition of calcium salts. The flukes fail to reach the bile ducts & become encapsulated in the liver parenchyma. In sheep, there is no calcium precipitation but the liver irregularly lobulated and distorted due to connective tissue proliferation. The bile ducts thickened, dilated and have bluish color & does not undergo calcareous infiltration.

Causative agent: Fasciola spp.

Judgment: Acute: Condemn the liver / **Chronic:** Condemn the affected part (slight), whole liver (severe)

Carcass: Examined for jaundice, emaciation & edema

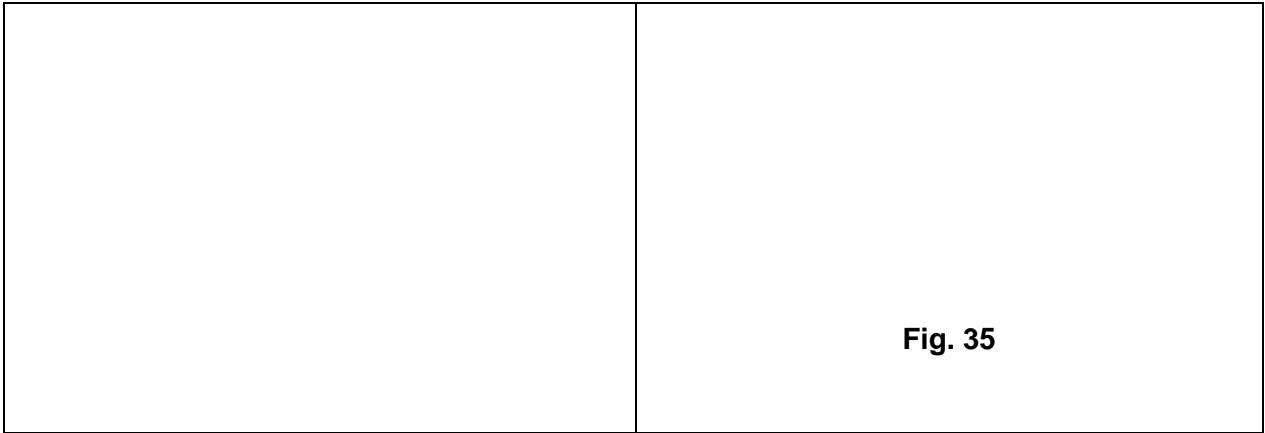


Bovine Liver "Cirrhosis"



Bovine Liver "Chronic Fascioliasis"

Fig. 34



2. Hydatid Cyst

It is the larval stage of *Echinococcus granulosus*, which inhabit small intestine of carnivore chiefly dog. It is a common affection in the liver of camel.

Causative agent: *Echinococcus granulosus*.

Judgment: Localized: Remove the cyst and surrounding tissue / **Multiple:** Condemn the liver.

Carcass: Approved if there is no systemic disturbance or muscular infestation.



Bovine Liver "Hydatid cyst"



Camel Liver "Hydatid Cyst"

Fig. 36

Fig. 37

3. *Cysticercus tenuicollis*

It is the larval stage of *Taenia hydatigena* of dog. Usually present under the capsule of liver, mostly in sheep & pig, rarely in cattle and camel.

Judgment: Light: Remove the cyst / Heavy: Condemn the liver.

Carcass: Approved if normal.



Fig. 38



Fig. 39



Fig. 40



Fig. 41: *C tenuicollis* ovine liver

4. *Linguatula* larvae

Yellowish or greenish nodule under the liver capsule. It could be identified by microscopic examination to identify the typical hooks of the parasite.

Causative agent: *Linguatula serrate*.

Judgment: Condemn the affected part.

5. Milk Spots

It affects liver of pig and caused by the migration of *Ascaris summ* larvae. Milk spots are focal interstitial hepatitis and found on both surface of the liver. It consists of white opaque center from which radiate interlobular septa. This affection may be confused with lesions caused by avian TB. In such condition grey flat like areas are found on the liver surface. Malchoire's palpation test is used to differentiate between lesion of avian TB and milk spots. The test includes, palpation of the upper part of the small intestine to manipulate *Ascaris* or not. Smear stained with Zeil Nelson to detect acid-fast bacilli of TB.

Judgment: Affected parts should be condemned in light cases, while the whole liver to be condemned in heavy affected infestation.

Fig. 42: Pig liver affected with Milk spots



6. Coccidiosis

It is caused by *Eimeria stiedea* and affect rabbit liver. Appear in the form of irregular white spots on liver parenchyma.

Judgment: Condemn the liver& carcass condemned if there is emaciation.

7. *Stilesia hepatica*

It is a cestode resembles *Monzia*. It affects the bile duct of sheep, goats, cattle and wild ruminants. The intermediate host is Oribatid mites. The bile duct may be occluded or form a sac-like dilatation filled with worms. Affected liver may show slight cirrhosis and the wall of the bile duct is thickened.

Judgment: Condemn the affected liver.

Fig. 43



Sheep Liver " Stilesia hepatica"

7. Cysticercosis

Causative agent: *C. bovis* (cattle), *C. cellulose* (pigs), *C. dromedari* (camel), *C. ovis* (sheep)

Judgment: Follow general cysticercosis protocol.



Camel Liver "multiple parasitic nodules"

Fig. 44



**Camel Liver
"Multiple
Parasitic
Cysts"**

Fig. 45

IV. Affections of the Lungs

1. Interstitial or interlobular emphysema

It is a common affection in the lung of aged animals, accompanied parasitic pneumonia, and also in young animals severely affected with *Dictyoculus viviparous*. Rupture of air alveoli results in escape of air bubbles into interstitial tissue. Emphysema may be extending to mediastinal tissue and subcutaneous tissue of thorax and abdomen.

Judgment: Organ: approved or Condemned in parasitic affection.
Carcass: Total condemnation if there is emaciation.



Emphysema , lung , cattle

Fig. 46



Fig. 47: Emphysema, lung ,cattle

Fig. 48: Emphysema, lung ,cattle



2. Pneumonia

The cause may be virus, bacteria, parasite, fungi, bad weather, inhalation of drugs or penetration of foreign bodies from reticulum. Pneumonia commonly seen in connection with specific diseases such as: bovine TB, shipping fever, enzootic pneumonia of calves and pigs, swine fever, extensive parasitic infestation of respiratory tract e.g. *Ascaris*. Fungi as *Candida albicans* and *Mucor* rarely give rise to pneumonia. In broncho-pneumonia (*Lobular pneumonia*), small pneumonic foci are intermixed with healthy tissue, while in lobar pneumonia the whole lobe or its greater part is in one stage of pneumonia.

Judgment: Lobular: Condemn affected part.

Lobar: Condemn the whole lobe,

Carcass: Approved if there is no systemic disturbance.

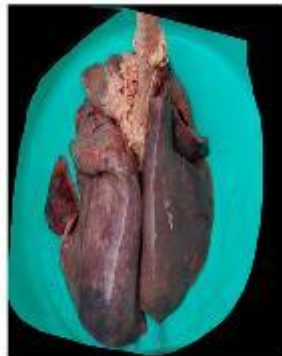


Fig. 49: Lobar pneumonia, lung, pig



Lobular pneumonia , lung , cattle

Fig. 50



Lobar pneumonia , lung, cattle

Fig. 51



Fig. 52: Lobar pneumonia, lung , camel

3. Contagious bovine pleuropneumonia CBPP

Contagious bovine pleuropneumonia is stages of hepatization, which surrounded by connective tissue. On cut section give marble appearance. Pneumonic foci undergo necrosis and become firm, dry and encapsulated to form sequesteraum.

Causative agent: *Mycoplasma mycoides*.

Judgment: Condemn the affected lung.

Carcass totally condemned if there is fever.

Fig. 53 : CBPP



4. Pneumomycosis

Pneumomycosis is a fungal affection of lungs due to *Aspergillus* or *Mucor*, most common in young fowl, ducks and geese (brooder pneumonia) and occasionally seen in lambs, pig and cattle. It is characterized by diffuse hepatization of the lungs with numerous grey or greenish spots scattered throughout the lungs with a thin deposits of mould in the bronchi.

Judgment: The affected lung must be condemned, and also the carcass in case of septic or gangrenous reactions.

5. Contamination of trachea and lungs

Trachea and lungs may be contaminated with ingesta or blood.

Judgment: The affected trachea and lungs are condemned.

Fig. 54



Lung Cattle "Aspiration pneumonia"

6. Melanosis

Black pigment on the lung tissue and bronchial lymph node.

Causative agent: Pigmentation disorder.

Judgment: Condemn lungs and its bronchial lymph nodes.

Fig. 55:
Melanosis ,
ovine pluck

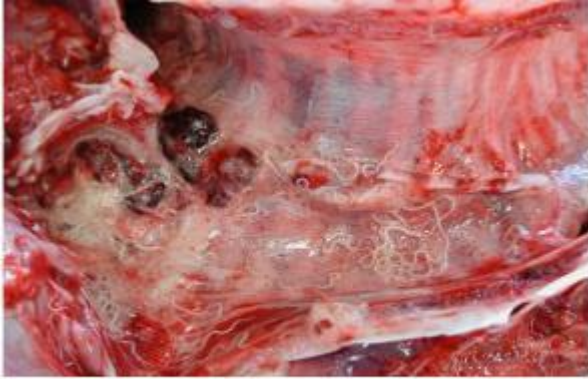


7. Parasitic

A.Parasitic Nematodes

Causative agent: Dictyocaulus spp., Metastrongylus spp.

Judgment: Condemn affected lungs; Carcass approved if normal.



Bovine trachea " Lung worm " (*Dictyocaulus viviparus*)

Fig. 56



Ovine trachea " Lung worm " (*Dictyocaulus filaria*)

Fig. 57

B. Hydatid Cyst

Causative agent: Larval stage of *Echinococcus granulosus*,

Judgment: Condemn affected part (light), condemn whole lung (heavy); Carcass approved if there is no emaciation, edema and or, muscular infestation.

Fig. 58



Lung cattle hydatid cyst

C-Immature form of Fasciola.

Judgment: Condemnation of affected part of the organ (small number, or Condemnation of lungs (large number).The carcass approved if there is no emaciation.

8. Tuberculosis

- Miliary TB.

- Acute early generalization.
- Acute late generalization.
- Caseous pneumonia.
- Acute acino-nodular TB.
- Chronic acino-nodular TB.
- Lung cavitation.
- Pearls or grapes disease.

Causative agent: *Mycobacterium bovis*

Judgment: Follow TB protocol .



Tuberculosis in Cattle Lung

Fig. 59



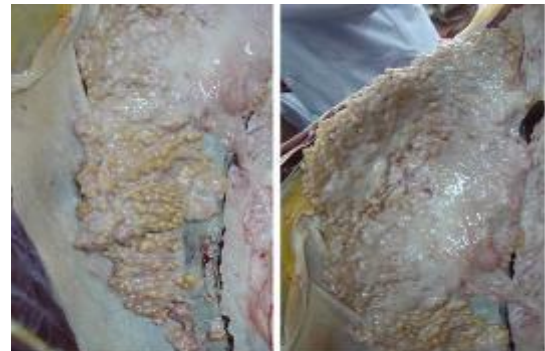
Lung Cattle " TB in bronchial L.N. "

Fig. 60



Tuberculosis in Cattle Lung

Fig. 61



Grape's disease in Cattle

Fig. 62

8. Anthracosis

Causative agent: Bluish-black pigment of lung and its lymph nodes due to inhalation of coal dust.

Judgment: Condemn affected lungs and its lymph nodes.

9. Pulmonary Edema

Causative agent: Occurs in congestive heart failure, atypical interstitial pneumonia

(Fusarium) and organophosphate poisoning.

Judgment: Case-dependent.

10. Pulmonary Abscess

Causative agent: Single or small multiple abscesses may originate from emboli from other organs as in cases of: septic metritis, septic mastitis, omphalophlebitis and /or penetration of foreign body. It may also occur as a part of primary diseases as: TB, actinobacillosis and aspergillosis.

Judgment: Condemn affected lungs; total condemnation if there is systemic disturbance.

11. Neoplasms

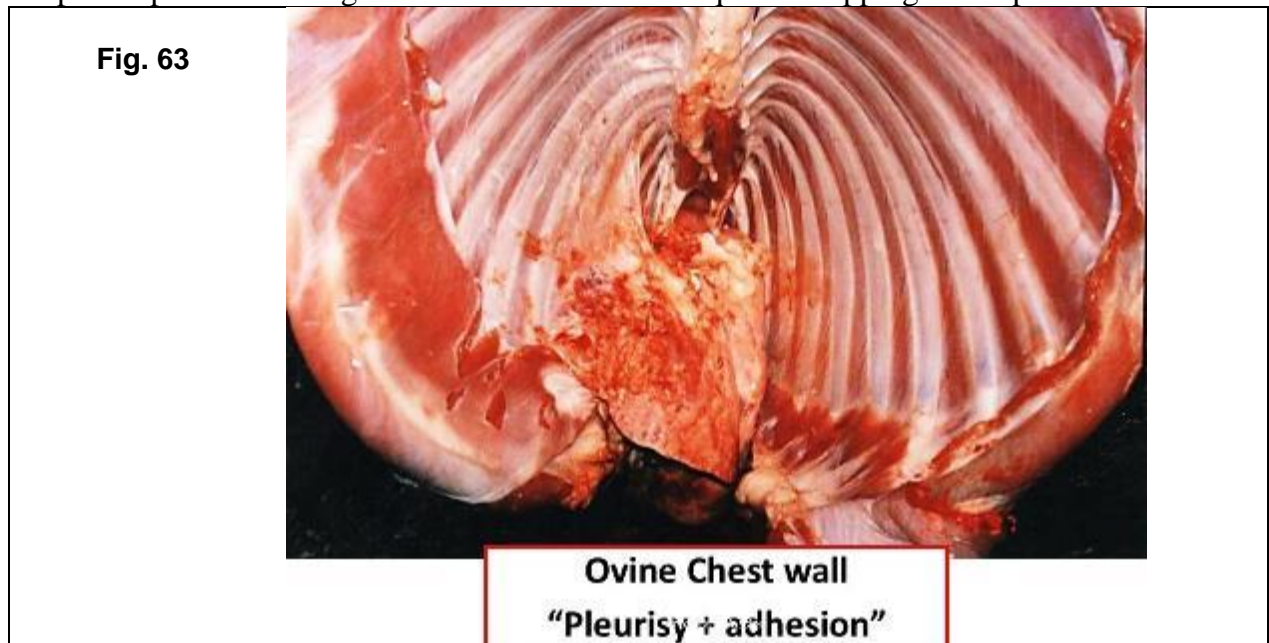
Causative agent: Lymphosarcoma, adenoma, melanoma

Judgment: Condemn affected lung or total condemnation in malignant tumors

V-Affections of the Pleura

1. Pleurisy

It is the inflammation of the pleura. Usually associated with pneumonia and in acute stage is characterized by fibrinous exudates, which in cattle has red and velvety appearance. Acute pleurisy may tend to assume a chronic form with the production of fibrinous adhesions between the partial pleura and lung surface. This condition required stripping of the pleura.



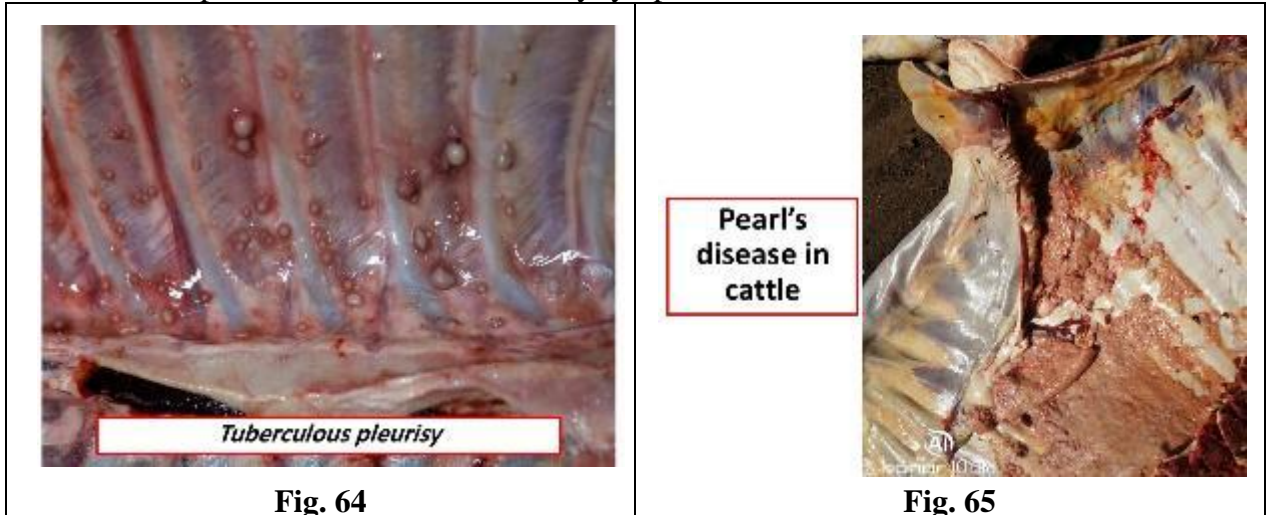
2. Sub-pleural petechial hemorrhage

The condition may be seen in many septicemic diseases including swine fever, swine erysipelas, & requires total condemnation.

3. Tuberculous pleurisy

Localized	Stripping of the pleura and flaming of the affected part.
Diffuse Acute Chronic	Condemnation of full forequarter at 11 th intercostal space. Axillary's negative: Ribbing, oystering, racking. Axillary's positive: Condemnation of full forequarter at 9 th intercostal space.

Oystering means removal of the dorsal vertebrae, sternum and ribs from the outer muscular mass which is passed for food if the axillary lymph node not affected.



4. Hydrothorax

It is an extensive accumulation of fluids in the pleural cavity. Occurs in congestive heart failure, bovine viral leucosis and generalized edema due to malnutrition.

5. Empyema

Empyema refers to the collection of pus in the pleural cavity.

6. Abscesses

Small abscesses containing pale green pus may be seen on the pleura.

7. Back bleeding

Occurs when the pleural membrane at the entrance of the chest is punctured during slaughtering with the aspiration of blood into the thoracic cavity.

VI. Affections of the Heart

Pericardium

1. Traumatic Pericarditis

Causative agent: Foreign body (wire).

Judgment: Total condemnation if there is fever, emaciation and or serous infiltration.

2. Tuberculous Pericarditis

Causative agent: Mycobacterium spp.

Judgment: Follow TB protocol.

3. Hydropericardium

Causative agent: Generalized edema.

Judgment: Condemn affected heart.

4. Pericarditis

Causative agent: Swine fever, salmonellosis, pasteurellosis

Judgment: Condemn affected heart; total condemnation if there is systemic disturbance.

Epicardium

1. Fibrinous Epicarditis

Causative agent: In pig , swine erysipelas ,However, in cattle the condition occurs as a result of traumatic pericarditis.

Judgment: Condemn affected heart.



Heart sheep "fibrinous epicarditis"

Fig. 66



Heart sheep "fibrinous epicarditis"

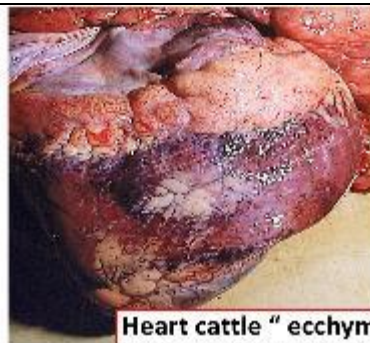
Fig. 67

2. Subepicardial petechial Hemorrhage

Causative agent: Septicemia.

Judgment: Total condemnation.

Fig. 68



Heart cattle "ecchymosis & petechial hemorrhage"

Myocardium

1. Myocardial Degeneration

In the form of cloudy swelling and pathological fatty changes. It is associated with toxic affections of the carcass and infectious febrile conditions.

Judgment: Condemn affected heart.

2. Myocardial Abscesses

It may be seen in the myocardium due to penetration of foreign bodies from the reticulum and /or pyemia.

3. Myocarditis

Causative agent: It occurs in all infectious febrile conditions as septic metritis, septic mastitis, listeriosis and /or toxoplasmosis.

Judgment: Condemn affected heart; total condemnation if there is systemic disturbance.

4. Tiger Heart

Causative agent: FMD (especially calves), the myocardium shows fatty degeneration alternative with Zenker's necrosis. The heart surface appears as like streaks and spots so, the term tiger heart is applied.

Judgment: Judged as FMD.

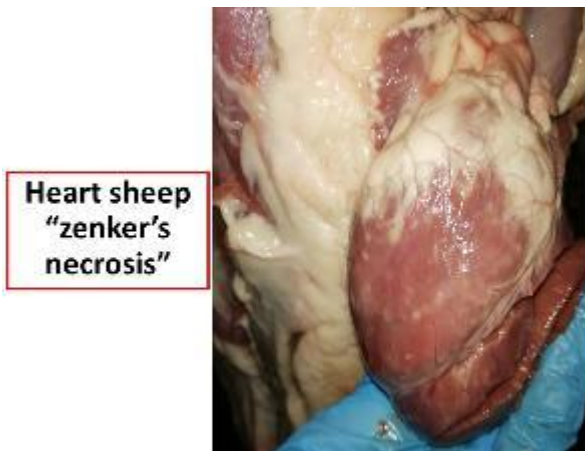


Fig. 69



Fig. 70

5. Brown Atrophy

Causative agent: The heart reduced in size, flabby, wrinkled, and brown in color due to accumulation of numerous pigment granules. The affection accompanied wasting diseases as TB.

Judgment: Condemn affected heart.

6. Parasitic Affections

Causative agent: Cysticercus spp., Hydatid cysts, Linguatula, Sarcocystis

Judgment: Condemn affected heart / carcass: Depend on causative agent.



Heart pig "multiple *C. cellulose*"

Fig 71



Heart sheep
"Hydatid
Cyst"

Fig 72

Heart sheep
"multiple
C. ovis"



Fig 73

Heart sheep
"*C. ovis*"



Fig 74



Heart cattle "*C. bovis*"

Fig 75

Heart camel
"*C. camelli*"

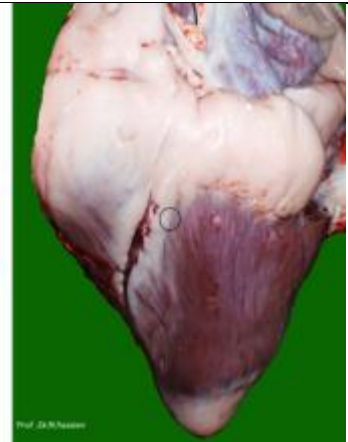


Fig 76

Endocardium

1. Vegetative Endocarditis

Causative agent: Chronic swine erysipelas.

Judgment: Total condemnation.

2. Ulcerative Endocarditis

Causative agent: Streptococci, *C. pyogenes*

Judgment: Total condemnation if there is systemic disturbance.

3. Subendocardial Hemorrhage

Causative agent: Septicemia, enterotoxaemia

Judgment: Total condemnation.

VII Affections of the Kidney

1. Degeneration

Causative agent: Cloudy swelling and pathological fatty change occur due to toxic affections .

Judgment: Condemn affected kidney.

Fig. 77



Fatty degeneration, kidney, cow

2. Congenital Cysts

Causative agent: Cyst free from urinary constituents. They may be single or multiple cysts. The cysts contained clear fluid within their thin transparent walls, which usually protrude from the surface. However, cysts may be found in the kidney parenchyma.

Judgment: 1-2 cysts: Approved.

Extensive: Condemn the whole kidney.

Carcass: Approved if normal.

Fig 78



Kidney cattle "Cyst"

3. Hydronephrosis

Causative agent: Urinary tract obstruction.

Judgment: Unilateral: Condemn affected kidney / **Bilateral:** Condemn both kidneys.

Carcass: Total condemnation if there is uriferous odor.

Fig. 79



Kidney pig "hydronephrosis"

4. Embolic or pyaemic nephritis

Causative agent: Characterized by multiple abscesses, small in size in the renal cortex due to circulation of pyogenic microorganisms in the blood. Kidney is flabby, pale color and multiple abscesses in the renal cortex.

Judgment: Condemn affected kidney.

Carcass: Total condemnation if there is pyaemia; or bacteriological examination if there is no pyaemia.

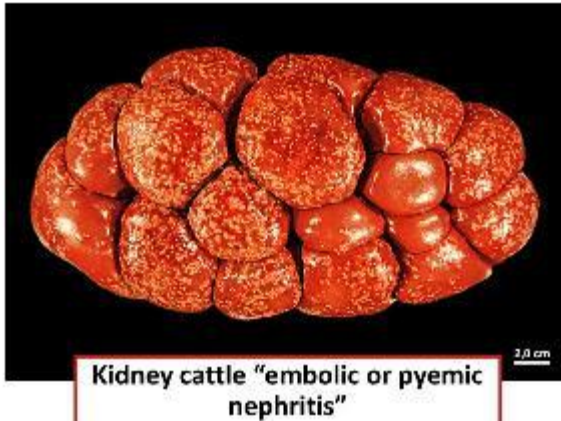
5. Pyelonephritis

Causative agent: Pyelonephritis occurs as a result of ascending infection with *Corynebacterium renal* or *C. pyogen*. Renal pelvis is dilated and contain slimy glassing fluid intermixed with pus and has strong smell of ammonia. Infection may be extended and give rise to large abscess in the kidney substance which may be uni or bilateral.

Judgment: Unilateral: Condemn affected kidney / **Bilateral:** Condemn both kidneys.

Carcass: Total condemnation if there is emaciation , edema , pyaemia or uremia.

Fig 80



6. Fibroblastic nephritis "White spotted kidney"

This condition is common in young calf suffering from brucellosis or salmonellosis. It is due to arrested in the embryonic kidney development. Affected kidney shows numerous white nodules that are circular in cross section.

Judgment: Condemn affected kidney.

Carcass: approved unless brucellosis.

Fig .81



7.Black Spotted Kidney

Causative agent: In the cortex of calf kidney assumes olive-green or black spots due to accumulation of the bile pigment (Biliverdin).

Judgment: Condemn affected kidney.

8.Pulpy Kidney Disease

Causative agent: Common affection in sheep suffering from enterotoxaemia, which caused by *Cl. welchii* type D. Kidney is soft and has hemorrhagic streaks.

Judgment: Total condemnation.

9.Tuberculous nephritis

Causative agent: Mycobacterium spp.

Judgment: (Generalized) Total condemnation

- If the kidney substance and its lymph node is affected with T.B
- If the kidney substance is free and the lymph node is affected with evidence of generalized TB.
- If the kidney substance is free and the lymph node is affected & the carcass free from emaciation. Condemn affected kidney& its lymph node only.

10.Parasitic Affections

Causative agent: Cysticerci, Hydatid cyst (In heavy infested carcass only)

Judgment: Condemn affected kidney.

11.Tumours

Judgment: Benign: Condemn affected kidney **Malignant:** Total condemnation

12.. Pigmentation changes

- Brown pigmentation: The condition mainly occurs in cattle due to accumulation of hemosiderin and lipofuscin pigments.
- Black discoloration: The condition occurs in sheep as a result of haemolysis caused by chronic copper poisoning.

Judgment: Condemn affected kidney.

13.Lymphomatosis

Causative agent: Lymphosarcoma.

Judgment: Condemn affected kidney.

VIII. Affections of the Spleen

1.Enlargement

Causative agent: Various diseases (e.g. anthrax, swine erysipelas, leukemia, Bl. parasites)

Judgment: Condemn affected spleen ,if associated with systemic disease total condemnation

**Splenomegaly,
spleen, cattle**



Fig. 82



Splenomegaly, spleen, cattle

Fig. 83

2.Tuberculosis

Causative agent: Mycobacterium spp.

Judgment: Total condemnation if there is generalized TB.

3.Parasitic Affections

Causative agent: Hydatid cyst, Linguatula, liver flukes, cysticerci.

Judgment: Condemn spleen in heavy infestation.

s4.Haematoma

Causative agent: Trauma or foreign body.

Judgment: Condemn affected spleen.

Fig. 84



Spleen cattle "Hematoma"

5.Slaughter Spleen

Causative agent: The condition occurs in cattle due to long pitting cane (more than 60 cm), which cause destruction of vasoconstrictor nerve (splenic nerve) followed by dilatation and congestion of spleen. The condition encountered in pig as a result of post mortem finding of live scalding.

Judgment: Condemn affected spleen.

6.Abscess

Causative agent: Abscesses of spleen may be occurs due to penetration of foreign bodies from the reticulum and lodgments of septic emboli.

Judgment: Condemn affected spleen.



Spleen sheep " Multiple abscesses"



Spleen pig " multiple abscesses"

Fig. 85

Fig. 86

7. Infarctions

Causative agent: End artery occlusion.

Judgment: Condemn affected spleen.

8. Neoplasms

Causative agent: Leukaemia, lymphosarcoma, melanoma

Judgment: Condemn affected spleen.

IX. Affections of the Udder

1.Simple Catarrhal Mastitis

Causative agent: *Streptococcus agalactiae*

Judgment: Condemn affected quarter or udder.

2.Septic Mastitis

Causative agent: *Staphylococcus aureus*, *C. pyogenes*

Judgment: Condemn affected udder; total condemnation if there is systemic reaction.

3.Tuberculous Mastitis – a-Chronic Nodular

Causative agent: Mycobacterium spp.

Judgment: Condemn affected udder.

b-Tuberculous Mastitis (Caseated Form)

Causative agent: Mycobacterium spp.

Judgment: Total condemnation

c-Tuberculous Mastitis (Miliary Form)

Causative agent: Mycobacterium spp.

Judgment: Total condemnation

X. Affections of the Blood

1.Anaemia

Causative agent: TB., Johne's disease, red water fever, parasites.

Judgment: Total condemnation if there is systemic disturbance.

2.Leukaemia and Leucosis

Causative agent: Lymphoid malignancy.

Judgment: Total condemnation.

3.Hemoglobinemia

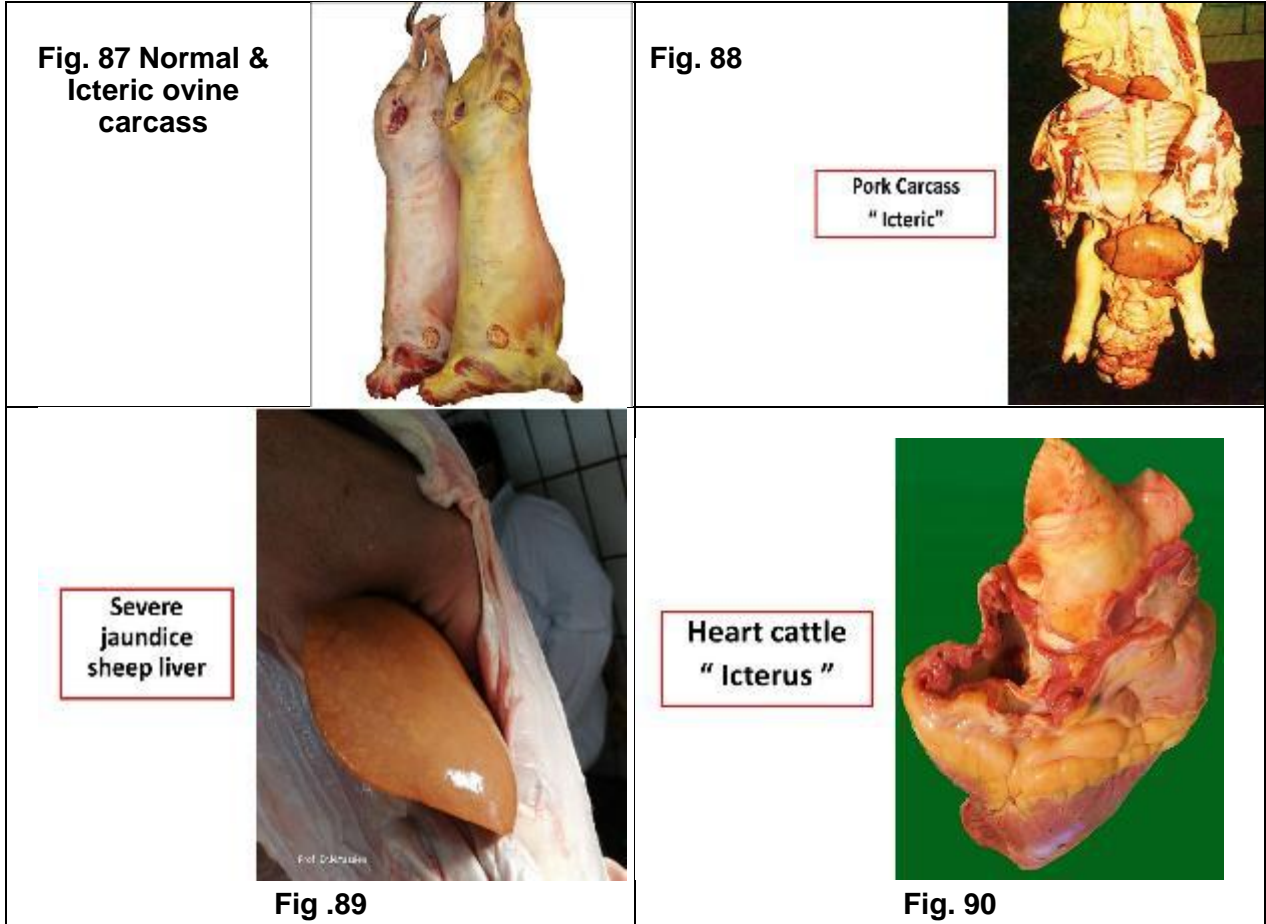
Causative agent: Babesiosis, leptospirosis, *Cl. haemolyticum*

Judgment: Total condemnation if there is icterus or ill bleeding.

4.Icterus

Causative agent: Obstruction, hemolysis, liver damage.

Judgment: Total condemnation if severe or persistent after detention in detained meat room for 24 hrs.



5.Uraemia

Causative agent: Urinary tract obstruction.

Judgment: Total condemnation if there is strong uriferous odor or positive boiling test.

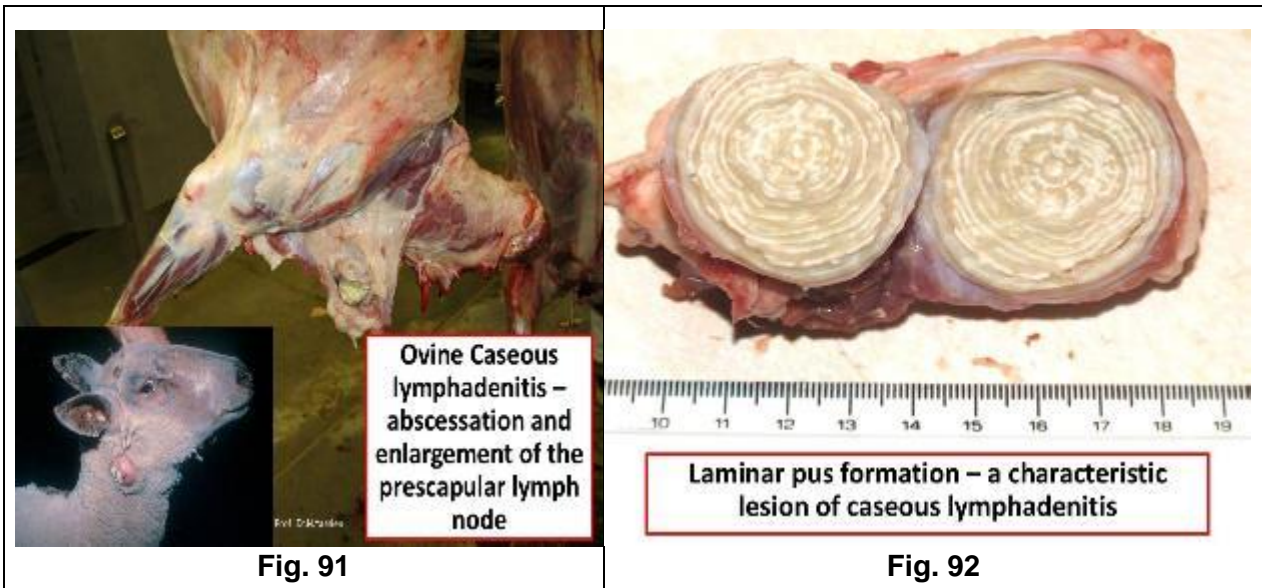
XI Affections of the Lymphatic System

1.Lymphadenitis

Causative agent:

- Acute lymphadenitis is manifested by swelling, congestion and edema of the node, which is painful and softer than normal e.g. Anthrax, and acute swine fever.
- Chronic lymphadenitis is manifested by the development of fibrous connective tissue in the affected node, which becomes enlarged and indurated. These changes may be seen in caseous lymphadenitis of the sheep, TB and actinobacillosis of the cattle.

Judgment: Condemn affected lymph nodes; total condemnation if generalized.



2. Pigmentary Changes

Causative agent: Anthracosis, xanthosis, melanosis

Judgment: Condemn affected nodes.

3. Parasitic Infestation

Causative agent: Linguatula, Muellerius, *F. hepatica*

Judgment: Condemn affected nodes.

4. Lymphangitis

Causative agent: Johne's disease, mycotic lymphangitis

Judgment: Condemn affected vessels and associated tissues.

XII. Affections of the Muscular System

1. Xanthosis

Causative agent: Unknown (common in cattle)

Judgment: Condemn affected muscles.

2. Degenerative Changes

Causative agent: Toxins, milk fever.

Judgment: Condemn affected muscles if there is systemic disturbance.

3. Muscular Fibrosis (Myositis Interstitialis)

Causative agent: Trauma.

Judgment: Condemn affected muscles.

4. Myositis

Causative agent: FMD, toxoplasmosis.

Judgment: Condemn affected muscles.

5. Gangrenous myositis

Causative agent: *Clostridium chauvoei*
Judgment: Total Condemnation.

Fig. 93 Gangrenous myositis , Bovine carcass



6. Muscular Dystrophy (White Muscle Disease)

Causative agent: Vitamin E / Selenium deficiency
Judgment: Condemn affected muscles.

7. Parasitic Infestations

Causative agent: *C. bovis*, *C. cellulosa*, *Trichinella*, Sarcosporidia, Hydatid cysts
Judgment: Condemn affected muscles.



Fig 94

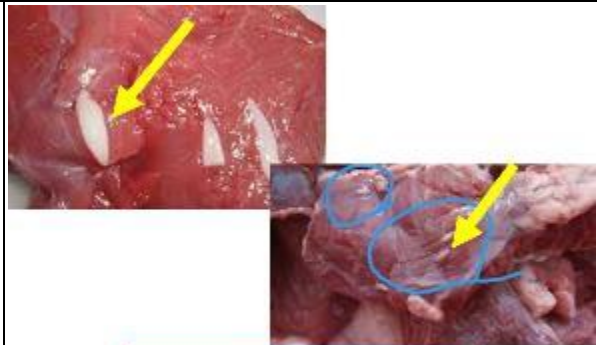


Fig 95

8. Tumors

Causative agent: Lymphosarcoma, rhabdomyoma, rhabdomyosarcoma
Judgment: Condemn affected muscles.

9. Actinobacillosis

Causative agent: Actinobacillus spp.

Judgment: Condemn affected muscle (head).

10. Muscular Atrophy

Causative agent: Nerve injury (e.g., radial nerve)

Judgment: Condemn affected muscle.

11. Bruising

Causative agent: Trauma

Judgment: Condemn bruised area; total condemnation if extensive.

Bruises, round, cow



Fig. 96

Extensive Bruises "Beef Carcass"



Fig .97

12. Muscular Hemorrhage (Shot Meat)

Causative agent: Pre-slaughter stress or poor stunning.

Judgment: Condemn affected parts if extensive.

Fig. 98 Muscular Hemorrhage



12. Dark Cutting Beef (DFD)

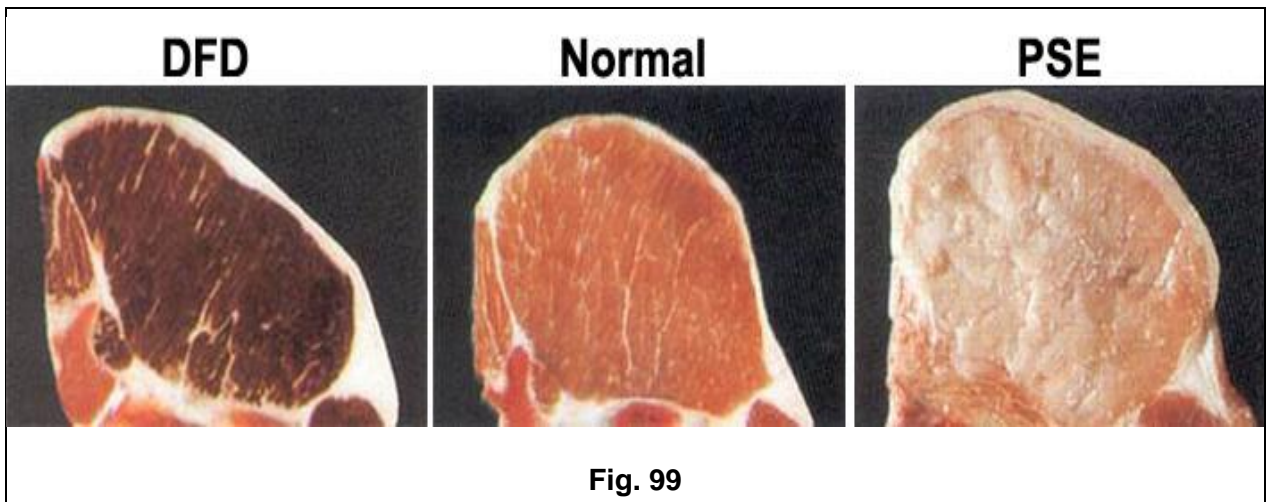
Causative agent: Pre-slaughter stress.

Judgment: Approved as inferior quality & used for meat processing.

13. Pale Soft Exudative (PSE)

Causative agent: Rapid pH drop post-slaughter.

Judgment: Approved as inferior quality meat & used for meat processing.



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Fig. 61	Manual on meat inspection for developing countries (FAO), 1994, CHAPTER 3 SPECIFIC DISEASES OF CATTLE, Available at: https://www.fao.org/4/t0756e/T0756E00.htm#TOC
Fig. 62	-----
Fig. 63	The authors (Prof. Nabil Yassien, Dr. Hamdy M.B.A. Zaki) own photo
Fig. 64	by MADELINE CIAK, WSMH StaffTue, October 9th 2018 at 9:07 AM Updated Wed, October 10th 2018 at 7:55 AM Available at: https://komonews.com/news/nation-world/michigan-government-warns-hunters-to-lookout-for-bovine-tuberculosis-in-deer
Fig. 65	-----
Fig. 66	The authors (Prof. Nabil Yassien, Dr. Hamdy M.B.A. Zaki) own photo from Basatin Abattoir Affections.

Fig. 67	Ovine Meat Inspection - 2nd Edition: Anatomy, Physiology and Disease Conditions, Nottingham University Press, Second edition, 2011, by Andy Grist
Fig. 68	Credit: PIADC, Photo ID: Available at: https://diseasephotos.com/hs_disease_pictures-2/
Fig. 69	The authors (Prof. Nabil Yassien, Dr. Hamdy M.B.A. Zaki) own photo from Basatin Abattoir Affections.
Fig. 70	The authors (Prof. Nabil Yassien, Dr. Hamdy M.B.A. Zaki) own photo from Basatin Abattoir Affections.
Fig. 71	Manual on meat inspection for developing countries (FAO), 1994, CHAPTER 4 SPECIFIC DISEASES OF Pig, Available at: https://www.fao.org/4/t0756e/T0756E00.htm#TOC
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Fig. 73	The authors (Prof. Nabil Yassien, Dr. Hamdy M.B.A. Zaki) own photo from Basatin Abattoir Affections.
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Fig. 79	Credit: PIADC, Photo ID: CSF_004, Available at: https://www.cfsph.iastate.edu/diseaseinfo/disease-images/?disease=classical-swine-fever https://www.cfsph.iastate.edu/DiseaseInfo/ImageDB/CSF/CSF_004.jpg
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Fig. 81	Available at: https://sesc.cat/en/white-spotted-kidney-in-a-bovine/
Fig. 82	The authors (Prof. Nabil Yassien, Dr. Hamdy M.B.A. Zaki) own photo from Basatin Abattoir Affections.
Fig. 83	The authors (Prof. Nabil Yassien, Dr. Hamdy M.B.A. Zaki) own photo from Basatin Abattoir Affections.
Fig. 84	Manual on meat inspection for developing countries (FAO), 1994, CHAPTER 2 GENERAL PATHOLOGICAL CONDITIONS, Available at: https://www.fao.org/4/t0756e/T0756E00.htm#TOC
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Fig. 89	The authors (Prof. Nabil Yassien, Dr. Hamdy M.B.A. Zaki) own photo from Basatin Abattoir Affections.

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Fig. 91	Ovine Meat Inspection - 2nd Edition: Anatomy, Physiology and Disease Conditions, Nottingham University Press, Second edition, 2011, by Andy Grist
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