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# PARASITIC DISEASE

**Parasite** means an organism that live on anther organism derive nutrient from it and cons confers no advantages in return

# **PARASITE MAY AFFECT THE ANIMAL HOST BY**

- 1-By sucking blood as haemonchus contours**
- 2-By robbing the host food as intestinal parasites**
- 3-By mechanical injury as liver cirrhosis as fasciola**
- 4-Transmission of diseases to man**

# **IN MEAT INSPECTION ,PARASITIC DISEASES CLASSIFY TO**

**1- parasite direct transmissible to man  
through consumption of raw meat or fish**

**Fish parasite transmissible to man**

**a-Opisthorchis felinus**

**b-Heterophes heterophes**

**c-Diphylobotrium latum**

**d-Aniskiasis**

**2-parasite indirect transmissible to man**

**a-Echinococcus granulosus**

**b-Linguatula rhinaria (Tongue worm)**

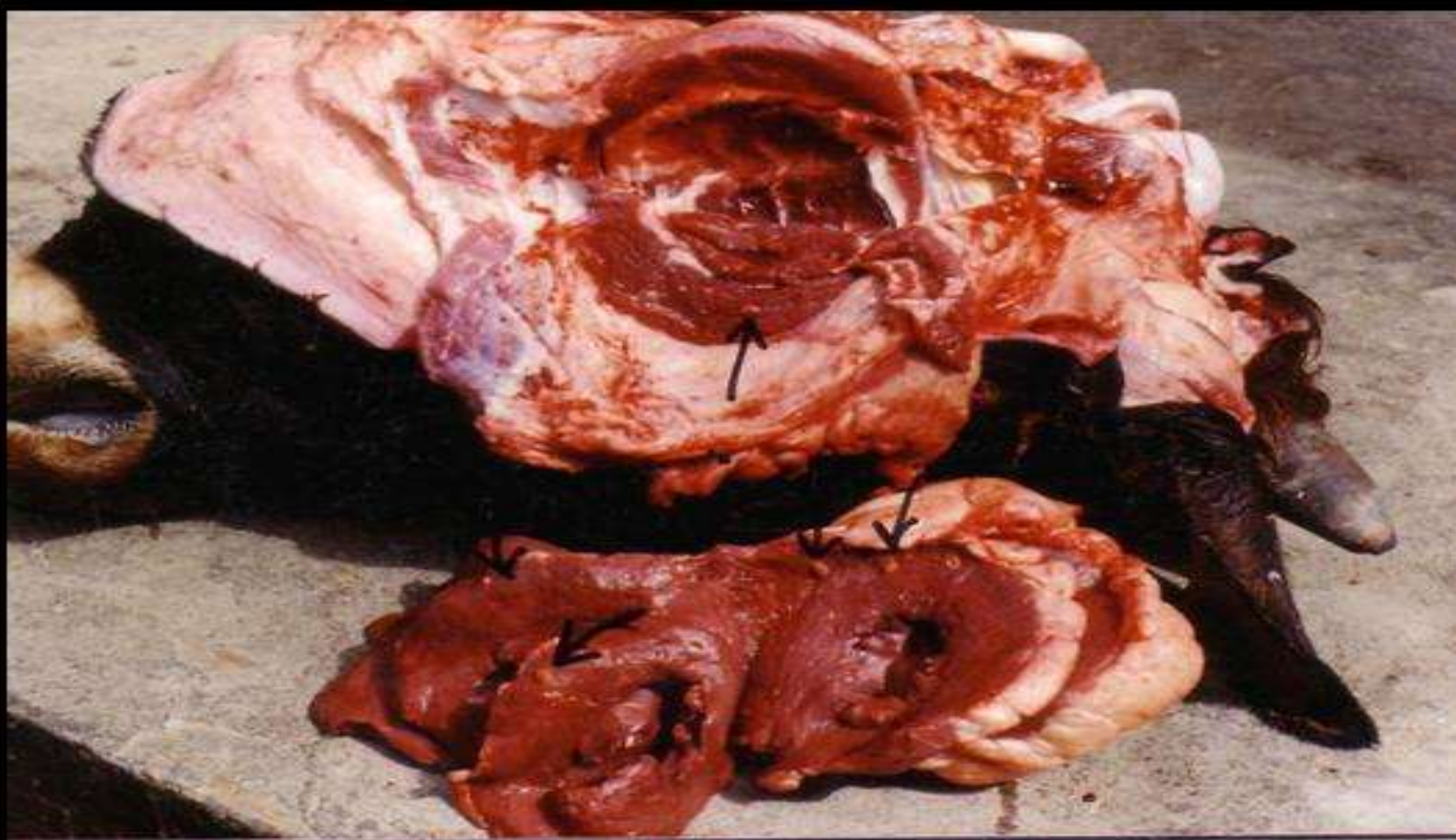
**3- parasite non transmissible to man but the flesh and organs of the carcass are repugnant and marketable**

**I- Parasites  
directly  
transmitted to  
man**

# **A- BEEF TAPEWORM (*TAENIA SAGINATA*)**

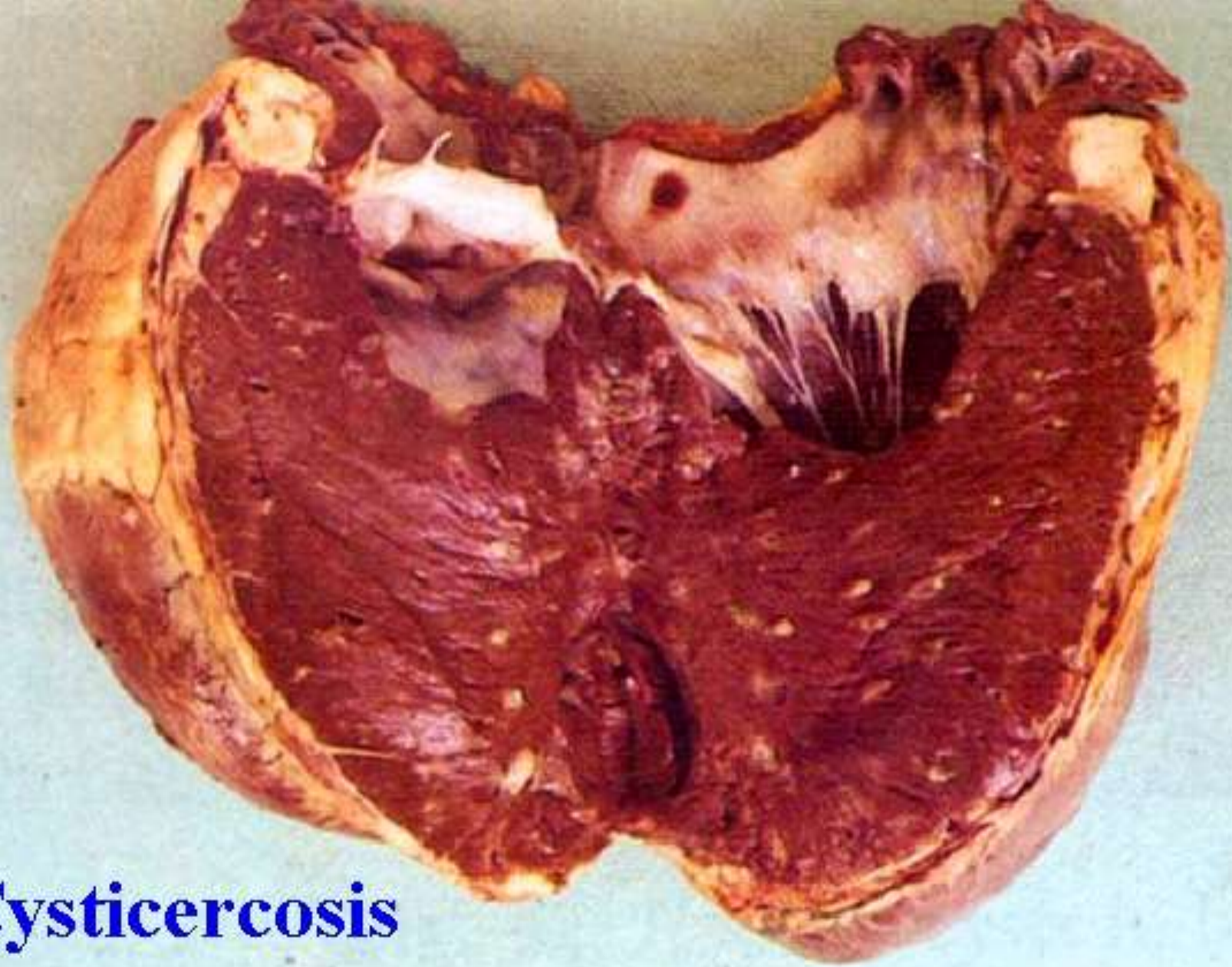
parasite lives in the small intestine of man.

**Life cycle:**



**Cysticercus bovis in masseter muscles and in  
heart muscles of cattle**





## **Cysticercosis**

**Cysticercus cysts in the cardiac muscles**

# **DIAGNOSIS OF C. BOVIS:**

## ***a-Location (predilection sites):***

**The cyst most commonly found in masticatory muscle, heart, tongue, shoulder, diaphragm, and oesophagus and occasionally in liver, lung, fat, and lymph nodes. For slight infestation, the triceps brachii muscle in of particular value (5-7.5 cm above the point of elbow joint, extends down to the humerus).**

# ***B-ROUTINE EXAMINATION:***

- The surface and substance of the tongue are examined by a longitudinal incision through the ventral surface but without organ injury.
- Multiple incisions through the inner and outer masseter muscles right and left from the lower of the bone to higher muscle insertion are made.
- The heart, examined visually for surface cyst, then incised, 3-4 incisions from the base to the apex through the wall of left ventricle (heavy musculature) and then one incision through the interventricular septum.

# ***C-DETAILED***

## ***EXAMINATION:***

To determine the extent of infection, the final inspection is as follows:

- Two incision into gracilis muscle of each thigh.
- Deep transverse cut is made into the shoulder 3-7.5cm above the point of elbow joint and then original one.
- After removal of the peritoneal covering, the diaphragm examined visually and then by multiple incisions in the muscular part and two longitudinal incisions are made in the pillars.
- A single deep longitudinal incision is made followed by several incisions inside the original one in the gluteal region (rump) on both sides.
- Oesophagus is separated from trachea and examined.
- The exposed muscular surface of split carcass is examined.

# **JUDGEMENT:**

**According to the Egyptian Meat Inspection Code, heavy infestation**

**means presence of two or more cysts, dead or a live, in an area of meat of size of palm of the hand, in different parts of the carcass. Heavy infestation necessitates total condemnation of the carcass except stomach, intestine, and bones, if free from cysts.**

**In light infestation, which does not fulfill the above-mentioned requirement, carcass should be treated before releasing “Conditionally Approved”.**

# "CONDITIONALLY APPROVED":

It means the treatment of meat before release for consumption by:

- **Pre-chilling** at 0°C to 1°C for 24hr, then freezing at -10°C for not less than 10 days.
  - **Boiling** at 100°C for 2.5 hrs, the cuts should be not more than 5 lbs with thickness of 10cm, and the thermal death point 58°C within 3-5 minutes for coagulation of cyst protein (albumin and this indicated by colour changes to grey and the juice not red so, the central temperature reaches 70°C.
- **Pickling** in brine salt solution 25% for 3-4 weeks at 5°C.
- **Steaming** under pressure (1/2) an autoclave for one hour

# **CONTROL OF TAENIA SAGINATA AND C.BOVIS:**

- Improving meat inspection facilities or technique.
- Prevention of cattle infection and contamination of its food.
- Education for human being about the dangerous of *C.bovis* and *taenia saginata*.
- Usually use non-toxic medicament as *Yomesan* for human treatment in endemic area.
- Using of modern method as immunodiagnostic and blood picture for detection of infestation.
- Vaccinating cattle against *C.bovis*.

# **B-PORK TAPEWORM (TAENIA SOLIUM):**

**This worm inhabits the upper part of the small intestine of man, may be found as a single worm or in endemic area as 23 worm in one intestine. The length of the worm is 2-5 meter.**



# LOCATION:

The muscles being invaded are those of the heart, diaphragm, tongue, neck, thigh, shoulder, intercostal and abdominal muscles, and some organs as lung liver, kidneys, eye and brain cortex.

Methods of examination:

- Living animal: Palpating the tongue for the presence of cyst.
- Carcass:
- Predilection sites.
- Triceps bronchi muscle, inspected by a deep incision 2.5cm above the elbow joint for lightly infested.

## **Judgement:**

**Presence of one cyst, dead or alive, needs total condemnation.**

## **Man cysticercosis :**

**Caused by:**

- Autoinfection by Retropristatlsis movement of small intestines.**
- Unclean fingers after defecation carry ova to the food.**
- Swallowing ova through the agency of water or unclean vegetables.**

# **CONTROL MEASURES:**

- Improvement of sanitation and personal treatment and hygiene.
- Efficient meat inspection, some countries apply the following:
  - Boiling.
  - Freezing at  $-10^{\circ}\text{C}$  for 4 days.
  - Pickling by brine solution 25% for 4 weeks.

# **(TRICHINELLOSIS OR TRICHINELLASIS)\_**

**Trichinosis is a disease caused by *Trichinella spiralis* characterized by enteritis, abdominal pain and pains resemble rheumatism (muscle disease) at later state. After 9 days of infection, where the larvae circulate in blood symptoms resemble influenza or typhoid fever and also give toxic products lead to myocarditis and fatal encephalitis with a mortality rate about 5% in man, 2000 larvae in muscle produce the symptoms but 8,090-10,000 larvae is fatal.**

# **METHODS OF DETECTION:**

- Naked-eye examination of pork carcass is not reliable until one year.**
- Routine laboratory examination by projecting microscope of most portions of predilection sites, between two slides at magnification of 30-40 (trichinoscope). In German, under 70-80, using two specimens divided into fourteen specimens, while in U.S.A. by natural or artificial digestion of flesh by gastric juice or with a solution of pepsin and HCL, then, chilled, centrifuged for larvae detection.**

# **JUDGEMENT:**

**Entire carcass with organs and fat is dangerous and needs total condemnation**

# **PARASITE INDIRECT TRANSMISSIBLE TO MAN**

**a-Echinococcus granulosus**

**b-Linguatula rhinaria (Tongue worm)**

# **A-ECHINOCOCCUS GRANULOSUS**

**Adult tape worm live in small intestine of dog and carinvora**



# **ECHINOCOCCUS(HYDATID CYST)**

**Consist of:**

**1-External cuticle membrane**

**2-internal germinal layer (number of small papillae of its inner surface which are developing broad capsules)**

**3-Broad capsules**

**4-Daughter cyst**



**Hydatid cyst  
in  
bovine heart**



**Hydatid cysts in bovine liver**

# SHAPE :

Controlled by the organ in which its grows(oval or spherical)

Size of hydatid cyst rang from pinehead to childhead but normally goose,s egg

**Sterile hydatid cyst:**

**Cystic fluid slightly turbid(90% in cattle,20%in pig,8% sheep)**

**Fertile hydatid cyst:**

**Cystic fluid clearly turbid by hydatid sand**

# **HYADATOSIS IN MAN**

- 1-Licking the hand and face by contaminated tongue of infected dog**
- 2-Handling of dog hair contaminated by feces**
- 3-Cross infection through sheep god-man in grass**
- 4-Rat and mice act as reservoir infection**

# **PATHOLOGY**

**Atrophy, Displacement manifestation, anaphalactic reaction and intoxication**

# JUDGMENT

Single cyst      condensation affected part  
Multiple cyst      condensation whole organs  
T.C      If systemic disturbance as edema and emaciation





# **ERADICATION OF HYDATID DISEASE**

- 1. Efficient meat inspection**
- 2. Prevention of exportation of dog from endemic area**
- 3. Dog are excluded from slaughter house and meat work**
- 4. Improvement personal hygiene and educational programs**
- 5. Hygienic disposal of affected organs**

# **B-LINGUATULA RHINARIA (TONGUE WORM)**

**occurs in the nasal and respiratory passage of the dogs**

**the parasite tongue shape**

**The sex is separate**

**The chief significance of linguatula in meat inspection is that the larval form (L.serrata) occurs in mesenteric lymph nodes of herbivorous animals which it gives lesions may be mistaken for tuberculosis**

**Judgment**

# **DIFFERENTIAL DIAGNOSIS:**

**Linguatula in mesenteric lymph nodes of cattle may be distinguished from T.B nodules by the following:**

**1-L.larvae found at periphery of mesenteric L.N.**

**2- Easily shelled out with point of knife**

**3-The hooklets of larvae(microscopically)**

**4-The nodules are yellowish,soft ,become gray when calcified**

**5-Smear stained with Zeil Nelson stain,**

**PARASITE NON  
TRANSMISSIBLE TO MAN  
BUT THE FLESH AND  
ORGANS OF THE CARCASS  
ARE REPUGNANT AND  
UNMARKETABLE**

# 1-NEMATODES

## a- *Ascaris*

*A. summ.*, *lumbercoids* affect pig

*A. ovis* affect sheep

*Neoascaris vitulorum* affect calf

# **B-LUNG WORMS**

**Dictyocaulus viviparus in bovine**

**Dictyocaulus filarial, prostotrongylus in ovine**

**Metastrongylus in pig**

# **C-ROUND WORMS**

**Trichostrongylus**

**Ostertagia**

**Homonchus**

**Trichuris**

**Cooperia**

**Nematodirus**

**Strongylus**

# **JUDGMENT**

**Condemn the affected organ and the carcass pass**

**In case of emaciation :total condemnation**



# 2-CESTODES (TAPE WORMS)

<b>Adult worm in dog</b>	<b>Larval stage</b>	<b>Intermediate host</b>
<b>Taenia ovis</b>	<b>Cycticervus ovis</b>	<b>Sheep</b>
<b>Taenia hydatigenia</b>	<b>Cycticerci tenuicoilus</b>	<b>Sheep</b>
<b>Multiceps multiceps</b>	<b>Conurus cerebralis</b>	<b>Sheep</b>
<b>Taenia pisiformis</b>	<b>Cysticercus pisiformis</b>	<b>Rabbit</b>
<b>Multiceps serialis</b>	<b>Coneurus serialis</b>	<b>Rabbit</b>

<b>Adult worm in Hyaena</b>	<b>Larval stage</b>	<b>Intermediate host</b>
<b>Taenia hyaenia</b>	<b>Cysticercus camelli</b>	<b>camel</b>



**Cysticercus ovis**  
sheep heart



*Cysticercus tenuicollis*  
liver of sheep

# **JUDGMENT**

**Slight infestation : condemn ation of cyst and part of surrounding tissue**

**Heavy infestation : : condemn ation of organs**

**Carcass approved if normal**

# **3-TREMATODES**

## **a-Fascioliasis**

**cause:**

**Fasciola hepatica**

**Fasciola gigantica**

**Comen in cattle and sheep liver**

**In acute stage**

**Liver is congested and swollen with petichal  
heamorage under capsule**

**In choronic stage**

**Cirrhosis and formation connective tissue in wall of  
bile ducts**



**Fascioliasis**  
fibrosis and thickening of the  
wall of bile ducts

# **JUDGMENT**

**1-Acute condemn the organ**

**2-Chronic light-condemn affected part**

**Sever- condemn whole liver**

**3-Carcass approved if there is no jaundice, emaciation or edema**



# 4-PROTOZOA

a-**Coccidia** especially *Eimeria stiedae* affect liver of rabbit

## b-**Sarcosporidia(sarcocyst)**

sarcocyst *miesheriana* affect pig

sarcocyst *tenella* affect sheep and goat

sarcocyst *blanchardi*, sarcocyst *mirisuta* and sarcocyst  
*cruzi* affect cattle

sarcocyst *gigantica* affect buffalo

# **C-BLOOD PARASITE**

**Babesia**

**Thileria**

**Anaplasma**

**Trypanosoma**

# **5-ARTHROPODES**

**Hypoderma bovis**

**Ostrous bovis**

**Osterous ovis**

# **JUDGMENT**

**Condemn the affected organ and the carcass pass**

**Total condemnation : In case of emaciation**

**THANK YOU**