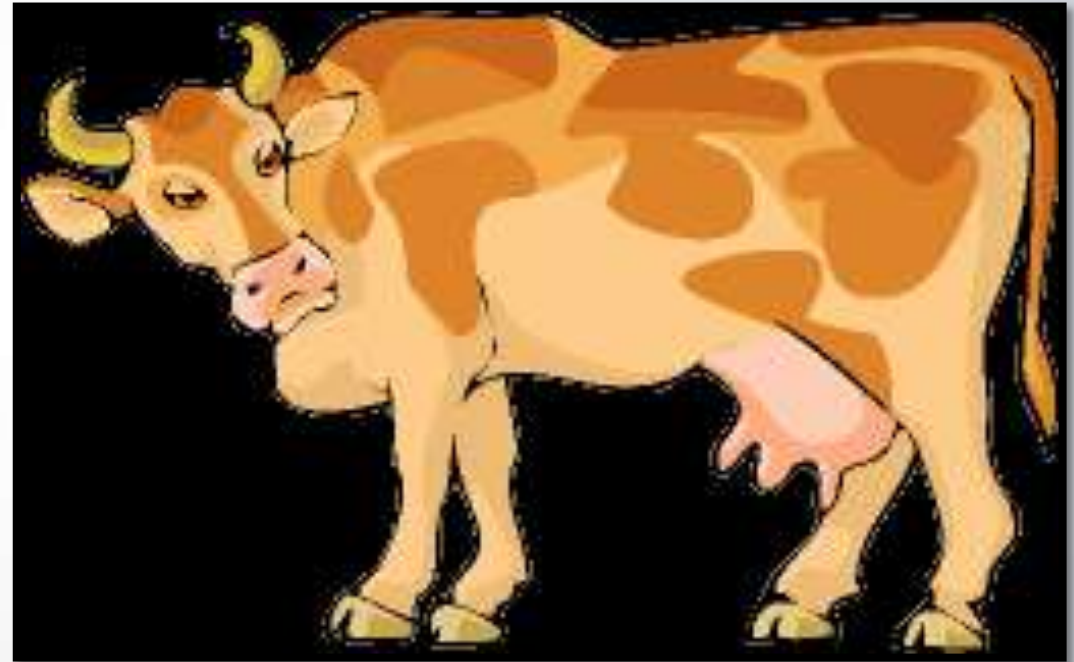
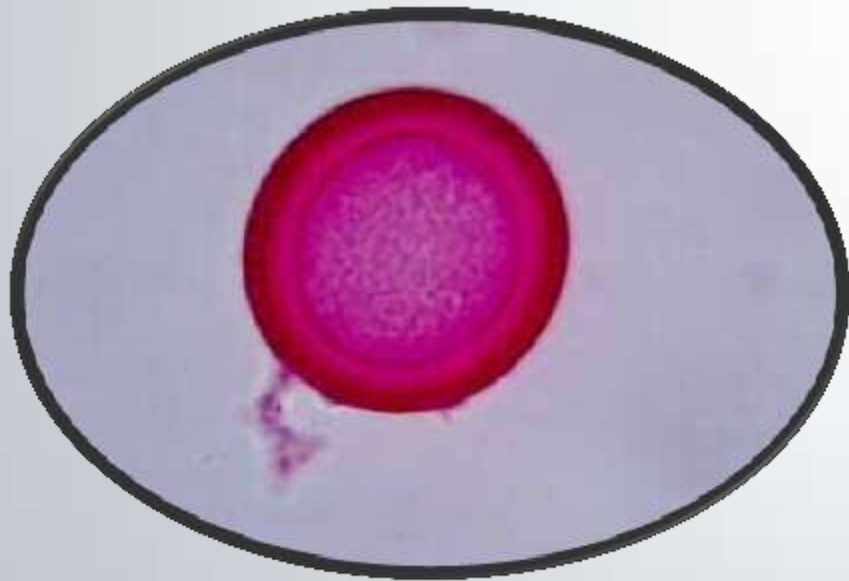


## *Taenia saginata and Taenia solium*

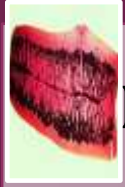
PRESENTED BY: DR. ASMA

# *TAENIA SAGINATA*

(Beef Tapeworm)



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# MORPHOLOGY

## *Taenia saginata*



This flatworm grow in length from 4 to 12 meters long & 2 millimeters in diameter



It consisting of a Scolex, Neck, and Strobila.



It has a flat, ribbon-like body shape that is important for absorbing nutrients from its hosts' intestine.

# EPIDEMIOLOGY

## Background

- The zoonotic parasite *Taenia saginata* transmits between humans.
- **Central and western Asia** and the Caucasus have large cattle populations and beef consumption is widespread.
- An **overview** of the extent of human *T. saginata* infection and bovine cysticercosis is lacking.

- A systematic review was conducted, that gathered published and grey literature, and official data concerning *T. saginata* taeniosis in central and western Asia and other countries
- The public health burden of *T. saginata* is assumed to be small as the parasite is of low pathogenicity to humans.

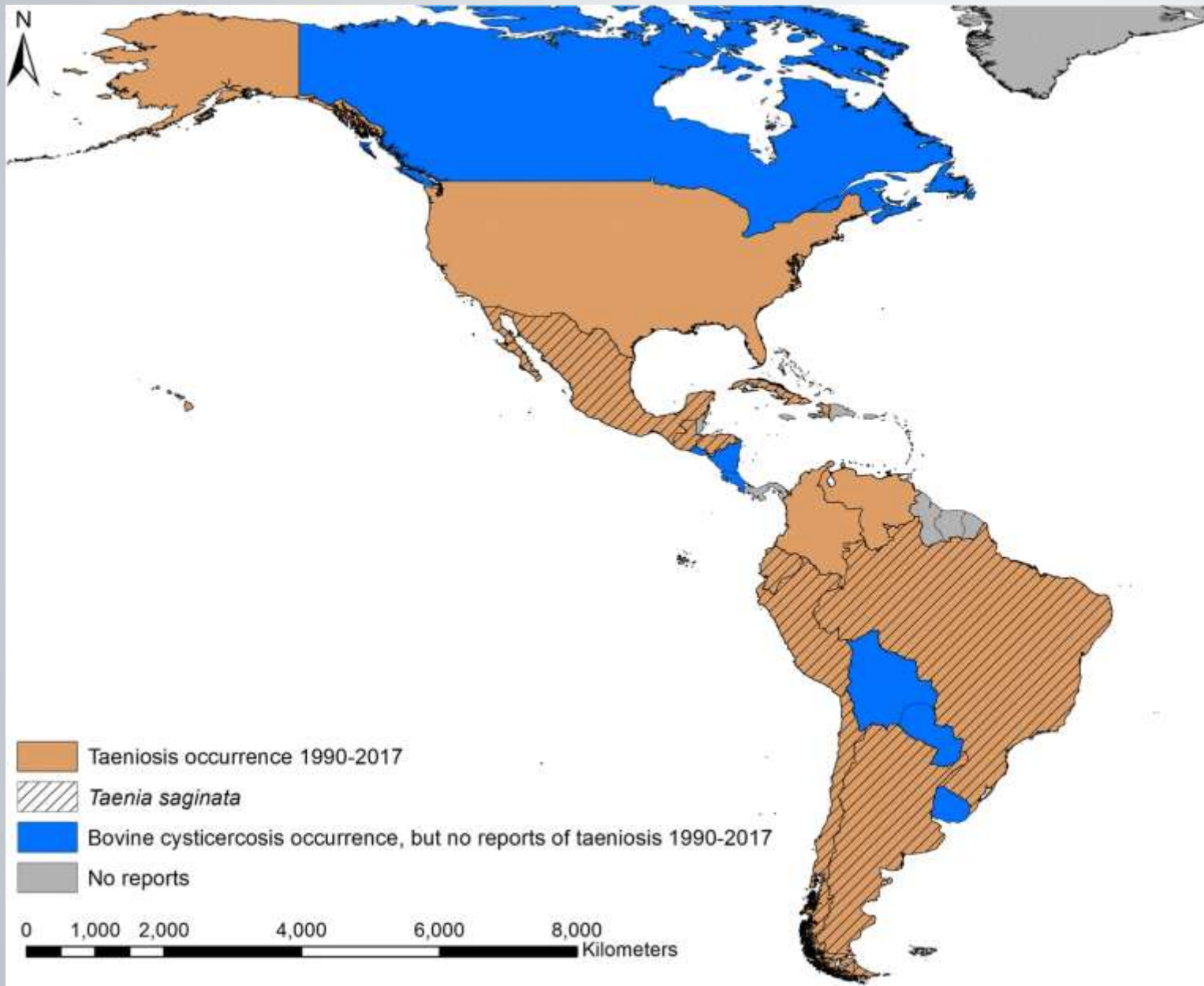


Fig .Countries with reports of taeniosis due to *Taenia saginata* and *Taenia* spp. in the period 1990–2017



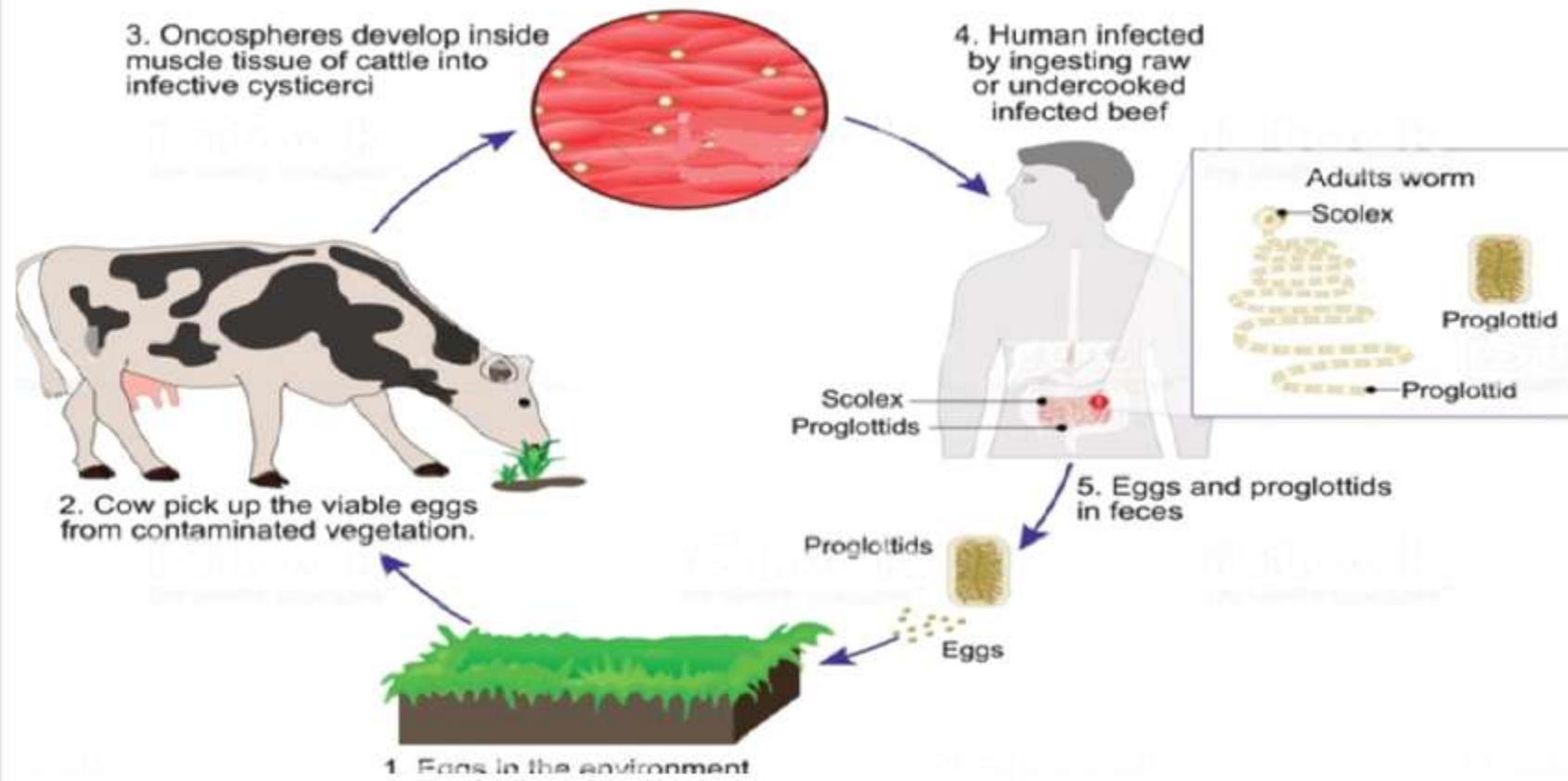
# DISTRIBUTION IN PAKISTAN

*Taenia  
saginata*

It is widely prevalent in the human population of Swat, **Pakistan**. It is found to be 32.6 % in prevalence in present study.

Other studies conducted in **Pakistan** showed low prevalence rate except Akhtar *et al.* (1993) who recorded the prevalence of infection to be 7.1% in hospital patients at Lahore.

# LIFE CYCLE OF *TAENIA SAGINATA*





# LIFE CYCLE

- Cattles are the only intermediate host of the *T. saginata*.
- Cattle will eat the eggs and the oncospheres will hatch in the duodenum under the influence of gastric juices.
- It will invaginate into the intestinal walls and travel via the general circulatory system.
- The embryos will disseminate all over the body and develop cysticercus in striated muscles of the cow within 70 days.
- Human beings will be infected if they eat the cow meat at this time
- Cysticercus begins to degenerate in 4 to 6 months.
- By the 9th month, most infected cows will die.

# CLINICAL FEATURES

- Infection which is usually asymptomatic.
- Heavy infection often results in weight loss.
- Dizziness
- Abdominal pain.
- Diarrhea.
- Headaches.
- Nausea.
- Constipation.
- Chronic indigestion.
- Loss of appetite.



abdominal pain



upset stomach



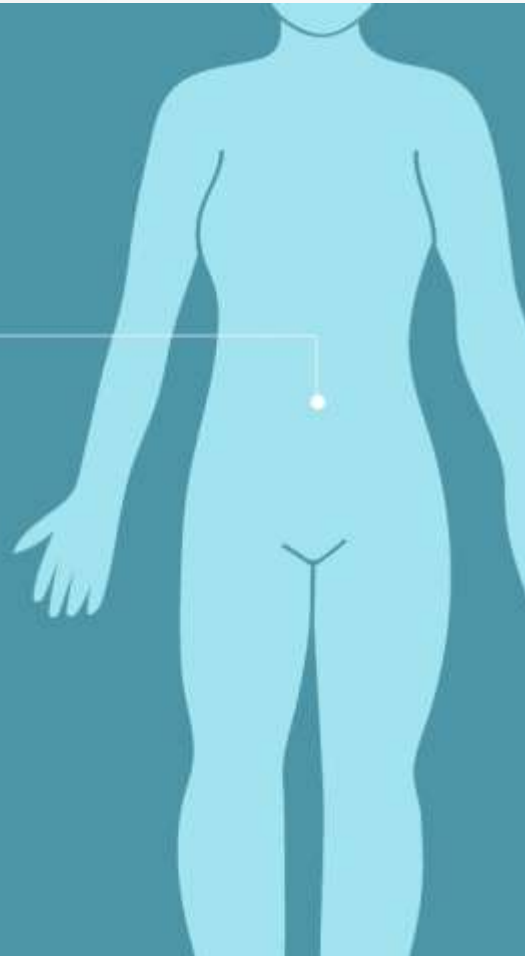
nausea



weight loss



fatigue and



## SYMPTOMS OF TAENIASIS

# PRECAUTIONS

Several steps can be taken to minimize *T. saginata* infection:

- ❑ A reliable method to prevent endemic spread of *T. saginata* is to detect infected cattle. The recommended method is for routine serologic surveillance of cysticercosis by the **ELISA**.
- ❑ Because egg can be viable from 16 days in untreated sewage to **159** days in grass, cattle should not be allowed to graze on contaminated grounds.
- ❑ Since human infection is acquired from consuming infected beef, it is advised that all beef products be inspected for cysticerci growths.
- ❑ Through cooking of the beef also provides complete protection.



# DIAGNOSIS OF *TAENIA SAGINATA*

- Diagnosis of *Taenia* tapeworm **infections** is made by examination of stool samples.
- Individuals should also be asked if they have passed tapeworm segments
- Stool specimens should be collected on three different days. After many days, stool is examined in the lab for *Taenia* eggs using a microscope



Stool Sample

# TREATMENT

- ❖ Treatment of *T. saginata* infection is with a single oral dose of **praziquantel** 5 or 10 mg/kg.
- ❖ Alternatively, a single 2-g dose of **niclosamide** is given as 4 tablets (500 mg each) that are chewed one at a time and swallowed with a small amount of water.



*TAENIA SOLIUM*

(Pork Tapeworm)

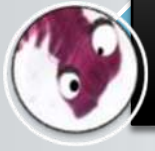




**INTRODUCTION**



**MORPHOLOGY**



**EPIDEMOLOGY**



**DISTRIBUTION IN  
PAKISTAN**



**LIFE CYCLE**



**CLINICAL FEATURES**



**DIAGNOSIS**



**TREATMENT**



**PRECAUTIONS  
AND CONTROL**



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- Triploblastic acoelomate

- Pork tapeworm
- Intestinal zoonotic parasite

- Adult worm lives in human intestine
- Larval form(Cysticercus cellulose) in pig

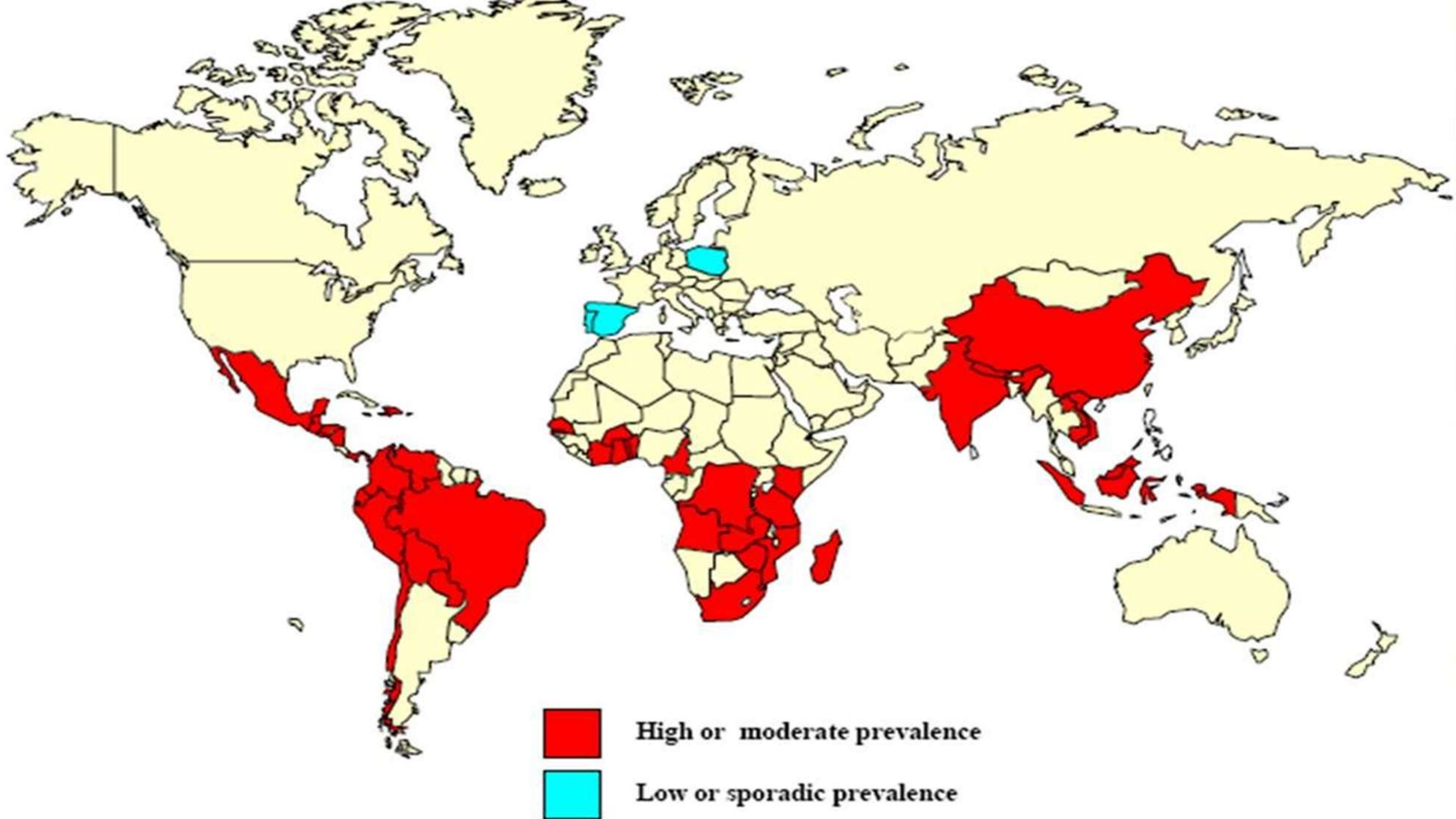
- Its life cycle consist of two hosts
  - i. Definitive host (human)
  - ii. Intermediate host (pig)

# EPIDEMIOLOGY

- *T. solium* has been effectively controlled in most of Europe, North America, and Australia while the highest prevalence is found in
  - Africa, Asia
  - Latin America
  - East Europe
  - China
  - Pakistan
  - and India

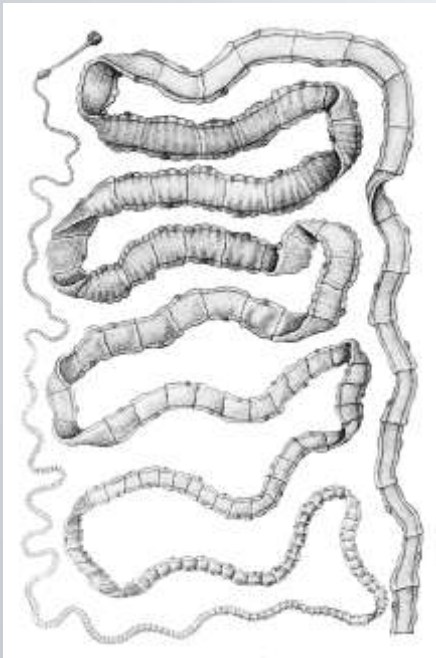
# DISTRIBUTION IN PAKISTAN

- ❑ **CYSTICERCOSIS** is considered a rare entity in Pakistan because of its association with eating of pork.
- ❑ It is estimated that about 40 million persons are infected worldwide.
- ❑ The pork tapeworm, *Taenia solium*, is a parasite of humans and pigs.

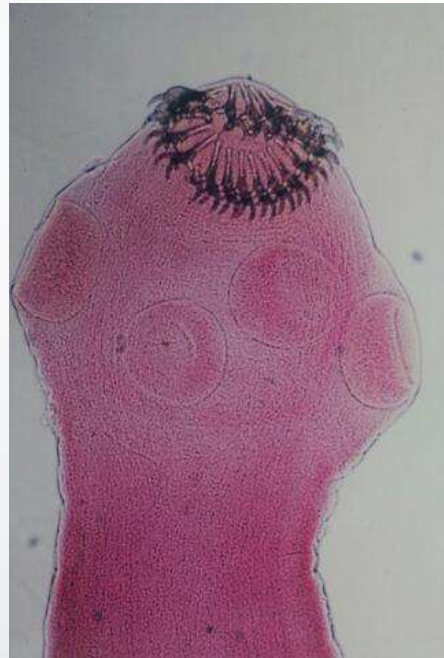


# MORPHOLOGY

- Adult is flattened ribbon-like, creamy white in color, measures about 2-4 m .



*Taenia solium* adult



*Taenia solium* scolex



Egg of *T. solium*



## SCOLEX

- 4 suckers, 1 rostellum
- 25-50 hooklets arranged in double crown
- Organ of attachment

## NECK

- narrowest part of the body
- Budding zone containing germinative tissue

## STROBILA

- immature proglottides: width > length
- mature proglottides: width = length
- gravid proglottides: width < length
- Each proglottid is a complete reproductive unit
- Tegument-villi-nutrition

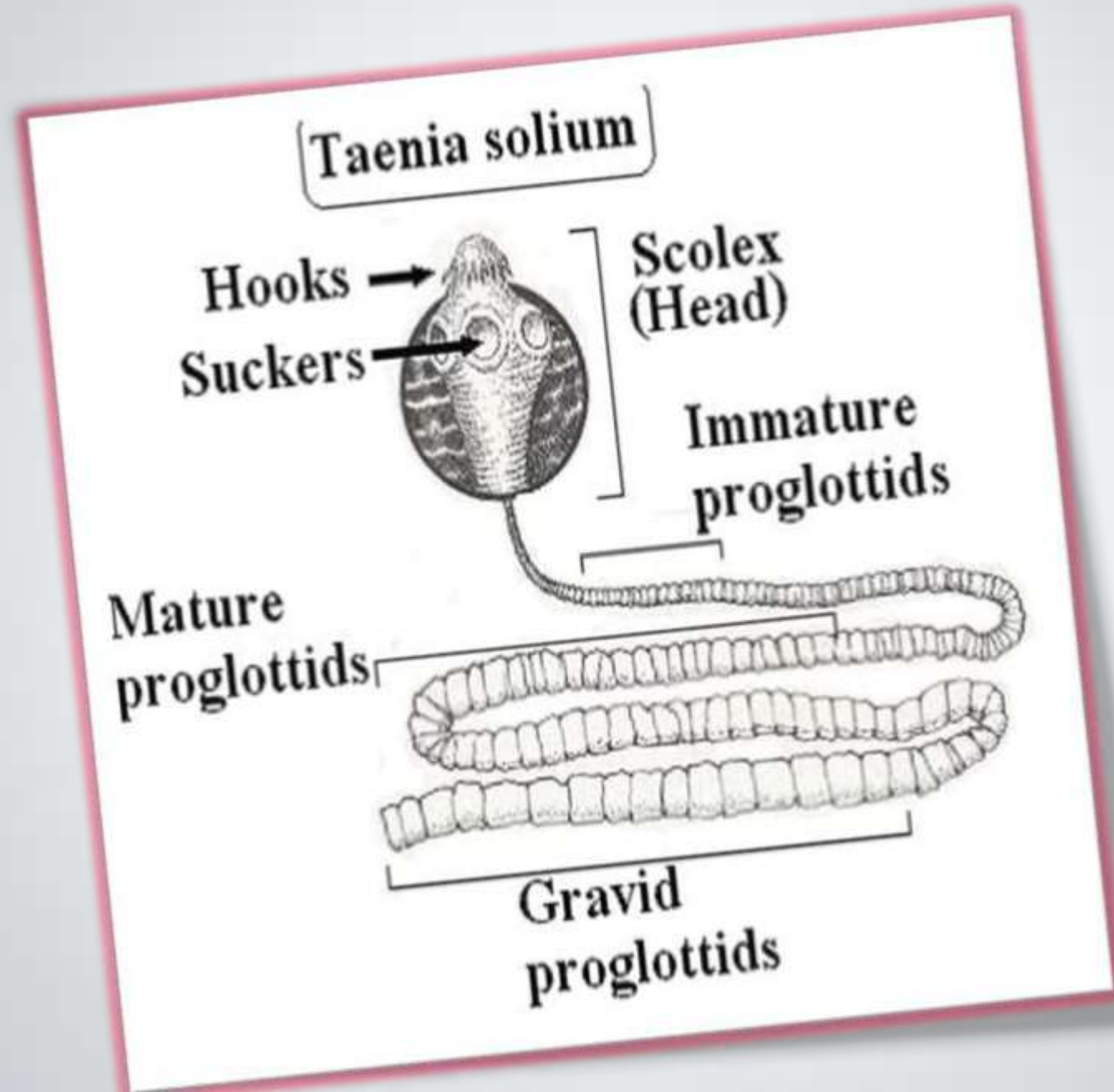
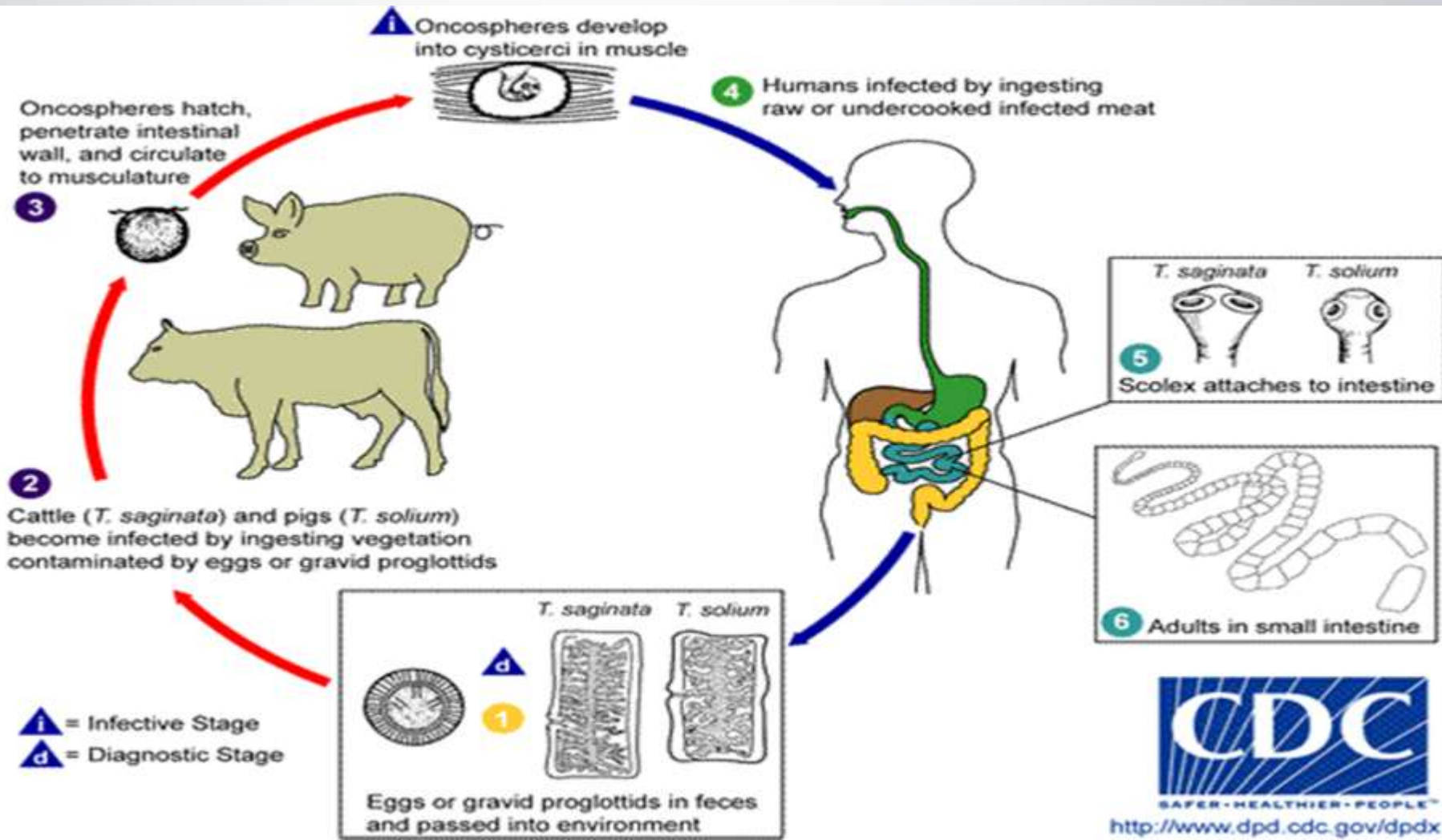
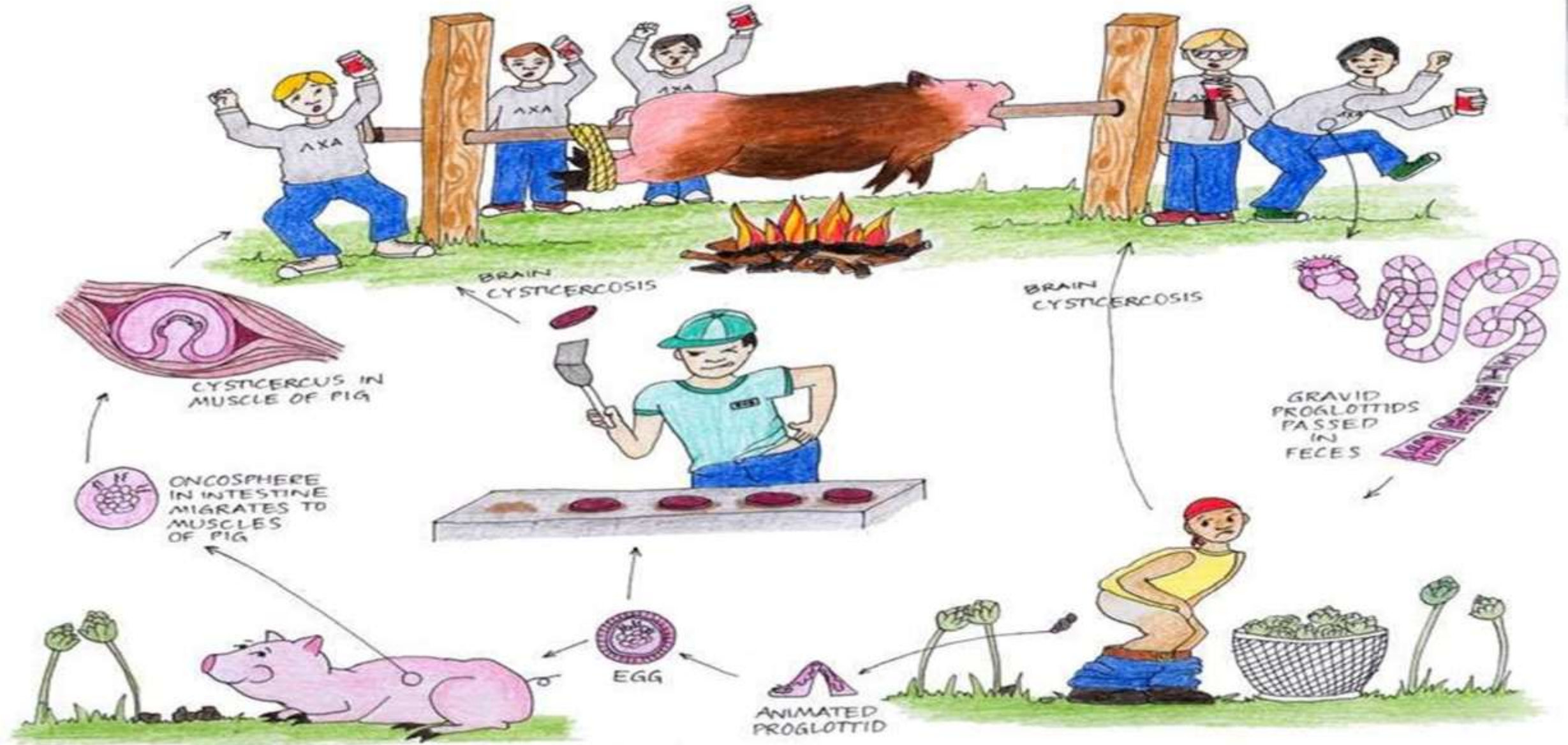


Fig structure of *Taenia solium*

# LIFE CYCLE







# LIFE CYCLE

- Humans ingest raw or undercooked pork containing cysticerci (larvae).
- After ingestion, cysts evaginate, attach to the small intestine by their scolex, and mature into adult worms in about 2 m.
- Adult tapeworms produce proglottids, which become gravid; they detach from the tapeworm and migrate to the anus.
- Detached proglottids, eggs, or both are passed from the definitive host (human) in feces.

- 
- Pigs or humans become infected by ingesting embryonated eggs or gravid proglottids (e.g, in fecally contaminated food). Autoinfection may occur in humans if proglottids pass from the intestine to the stomach via reverse peristalsis.
  - After eggs are ingested, they hatch in the intestine and release oncospheres, which penetrate the intestinal wall.
  - Oncospheres travel through the bloodstream to striated muscles and to the brain, liver, and other organs, where they develop into cysticerci. Cysticercosis can result.

# PATHOGENESIS

TAENIASIS

## Minor Symptoms

- Abdominal Pain
- Diarrhoea
- Nausea Or
- Asymptomatic

gravid proglottids  
in faeces (60,000) eggs

2 months of  
infection

Scolex attaches  
to mucosa

# SYMPTOMS

- The presence of *T. solium* worms in the human intestines usually does not cause major problems but
  - Diarrhea
  - Constipation
  - Indigestion
  - and other mild stomach symptoms are common.

# CYSTICERCOSIS

- Viable cysticerci (larval form) in most organs cause minimal or no tissue reaction, but death of the cysts in the CNS can elicit an intense tissue response. Thus, symptoms often do not appear for years after infection.
- Infection in the brain (**neurocysticercosis**) may result in severe symptoms due to mass effect and inflammation induced by degeneration of cysticerci and release of antigens.
- Depending on the location and number of cysticerci, patients with neurocysticercosis may present with seizures, signs of increased intracranial pressure, hydrocephalus, focal neurologic signs, altered mental status, or aseptic meningitis.

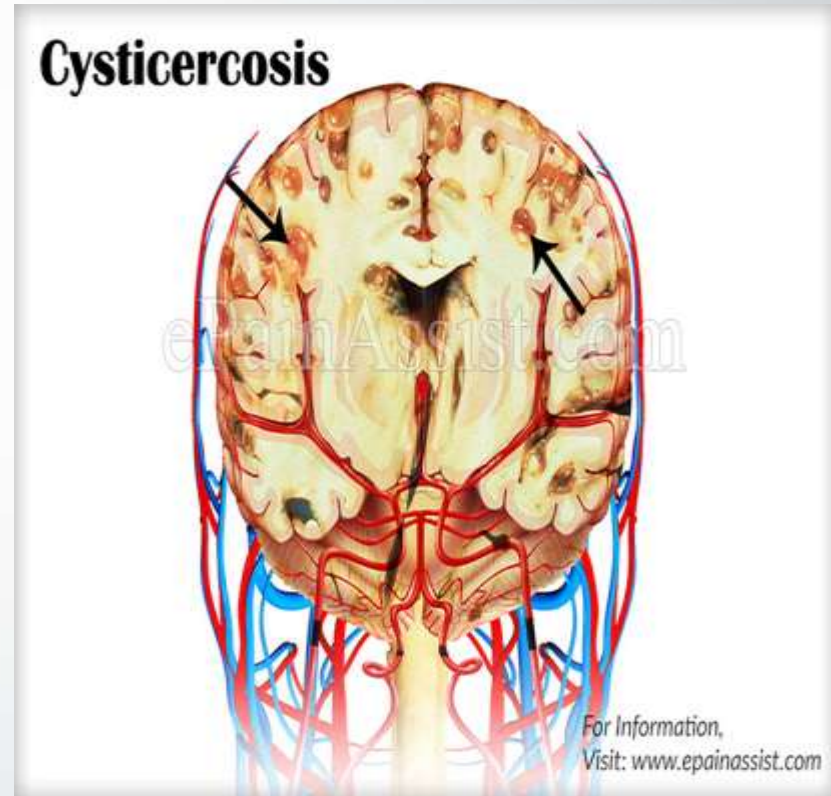
- Cysticerci may also infect the spinal cord, muscles, subcutaneous tissues, and eyes.
- Substantial secondary immunity develops after larval infection.



The subcutaneous nodules are usually found in head, limbs, neck, abdomen and back.

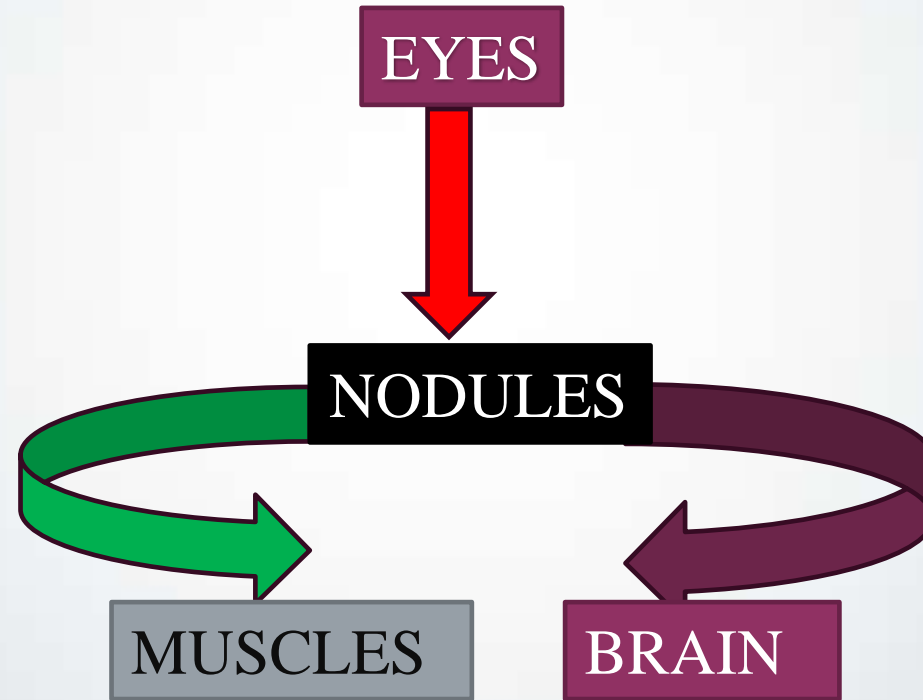
Suzuki, Iwata

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# CYSTICERCOSIS

INFECTED TISSUES AND  
ORGANS





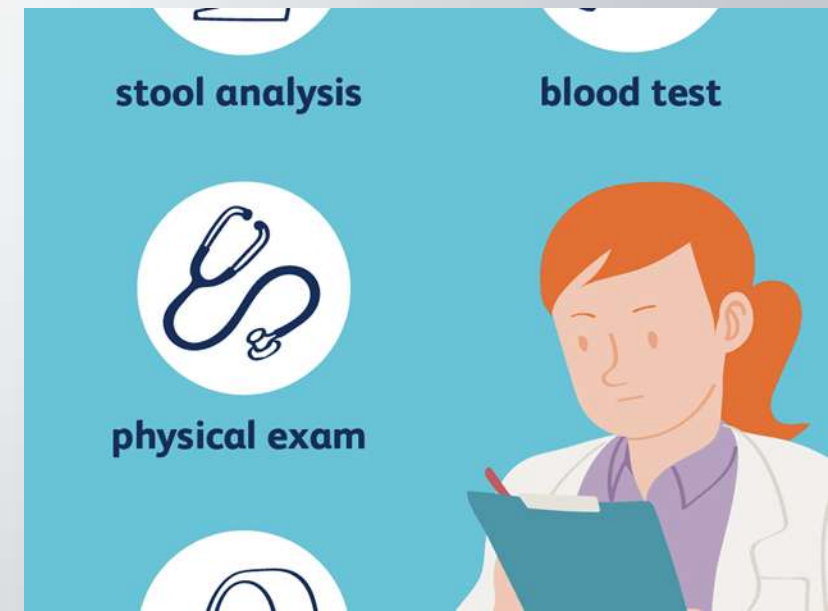
# DIAGNOSIS

**Stool tests** commonly include microbiology testing – the microscopic examination of stools after concentration aims to determine the amount of eggs. Specificity is extremely high for someone with training but sensitivity is quite low because the high number of eggs in small amounts of sample.

**Stool tapeworm antigen detection:** Using ELISA increases the sensitivity of the diagnosis. The downside of this tool is it has high costs, an ELISA reader and reagents are required and trained operators are needed.

**Stool PCR:** This method can provide a species-specific diagnosis when proglottid material is taken from the stool. This method requires specific facilities, equipment and trained individuals to run the tests. This method has not yet been tested in controlled field trials.

**Serum antibody tests:** using immunoblot and ELISA, tape-worm specific circulating antibodies have been detected. The assays for these tests have both a high sensitivity and specificity



# TREATMENT

- Taeniasis is typically treated with medications prescribed by your doctor. Medications for the treatment of taeniasis include
  - Praziquantel (Biltricide)
  - Albendazole (Albenza).
- Both drugs are antihelmintics, which means that they kill parasitic worms and their eggs. In most cases, these medications are provided in a single dose. They can take a few weeks to fully clear an infection. The tapeworm will be excreted as waste.
- Common side effects associated with these medications include dizziness upset stomach

# PREVENTION

- Cook your pork products adequately.
- Patient with *T.solium* infection should be treated immediately and fecal matter disposed of cautiously. Chances of autoinfection or ingestion of egg must be limited.
- The stool of food handler of recent emigrants from endemic countries should be tested for proglottids.
- Careful handwashing is important, especially for food handlers

## 5 things to do about the pork tapeworm (*Taenia solium*)

1.  
Always  
use a  
toilet



2.  
Prevent  
pigs from  
roaming  
free



3.  
Go to the  
doctor/  
hospital



4.  
Wash  
your  
hands



5.  
Cook  
pork  
well



Fig: precautions to prevent from *Taenia solium*

Thank  
you!

The image features the words "Thank you!" in a vibrant, 3D-style font. The word "Thank" is rendered in a gradient of pink, orange, and purple, while "you!" is in a gradient of teal and light green. Each letter has a thick black outline and a shadow effect, giving it a three-dimensional appearance. The text is decorated with several yellow five-pointed stars, some of which are integrated into the letterforms. The entire graphic is set against a plain white background.