BRUCELLOSIS

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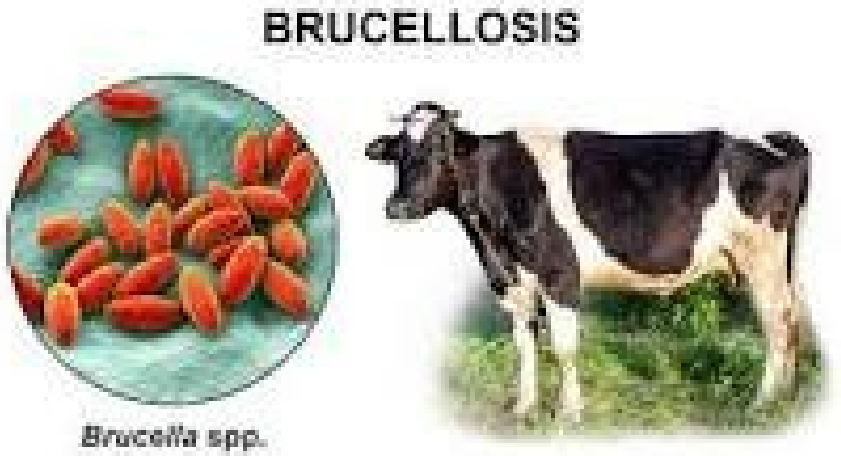
- MODULE : INFECTION/ INFLAMMATION
- TOPIC : ZOONOSIS

INTRODUCTION

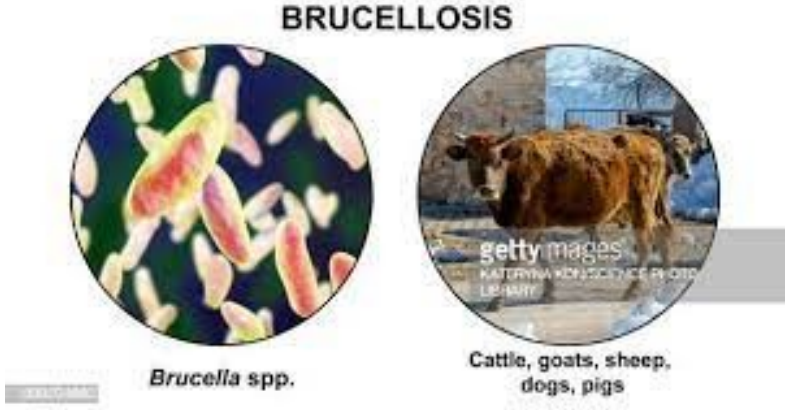
1. Brucellosis is a highly contagious zoonotic disease
2. It is also called MALTA FEVER OR BANGS DISEASE
3. It is a disease of domestic and wild animals



CAUSATIVE FACTORS

Caused by

- ingestion of unsterilized milk
- Ingestion of meat of an infected animal
- Close contact with secretion of infected animals like sheep, goat ,pigs and other animals.
- The disease is rarely transmitted between humans



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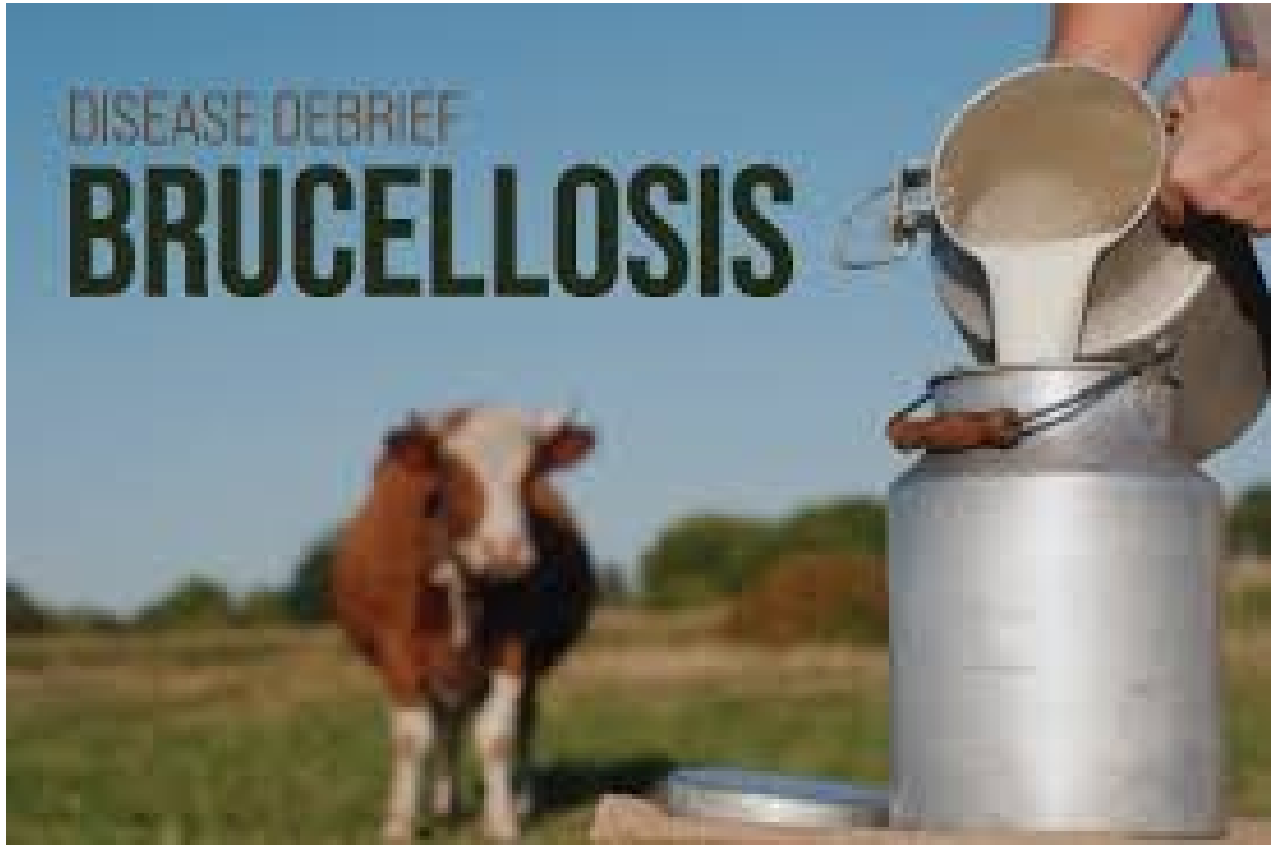
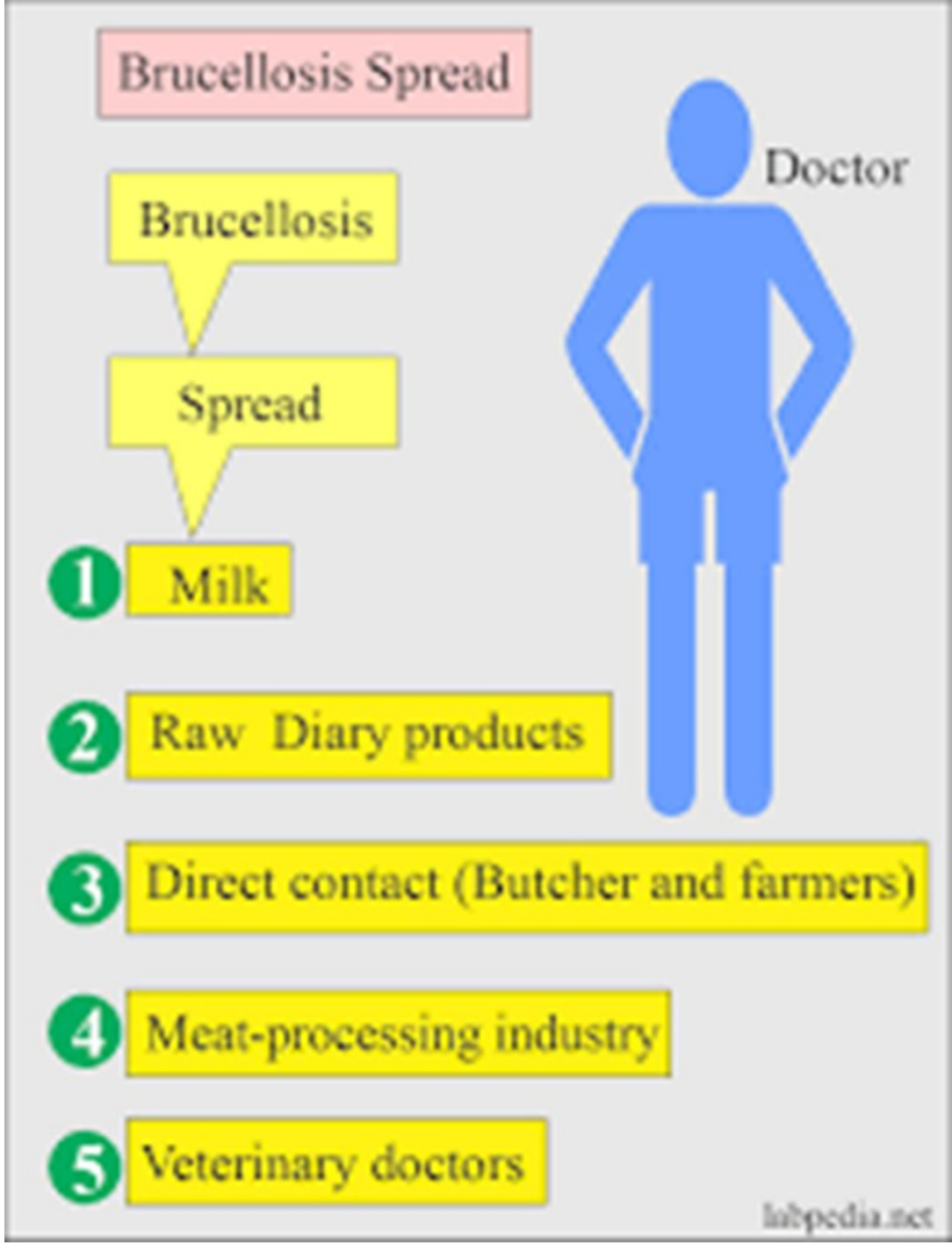




HISTORY

- In 1886 Bruce isolated species brucella melitensis from spleens of Malta fever victims

BRUCELLOSIS IN HUMANS

- Brucellosis is mainly associated with ingestion of unpasteurized milk and soft cheese made from milk of infected animals
- Mainly from goats infected with brucella melitensis
- Occupational exposure of lab workers, veterinarians and slaughter house workers
- Hence more among males

BACTERIOLOGY

- Brucella is a gram negative cocci.
- Strict aerobic, non motile, non spore forming
- Other forms are brucella ovis,
- Brucella suis: principal host is swine so hunters are usually at risk
- brucella abortus : principal host is cattle
- They have incubation period of about 4 weeks
- Brucella melitensis : principal host is goat and sheep
- Mostly pathogenic in humans

EPIDEMIOLOGY

- Brucellosis occur world wide ,
- Most endemic areas are

1. countries from Mediterranean basin
2. Arabian Gulf
3. Indian subcontinent
4. Mexico
5. Central and south America

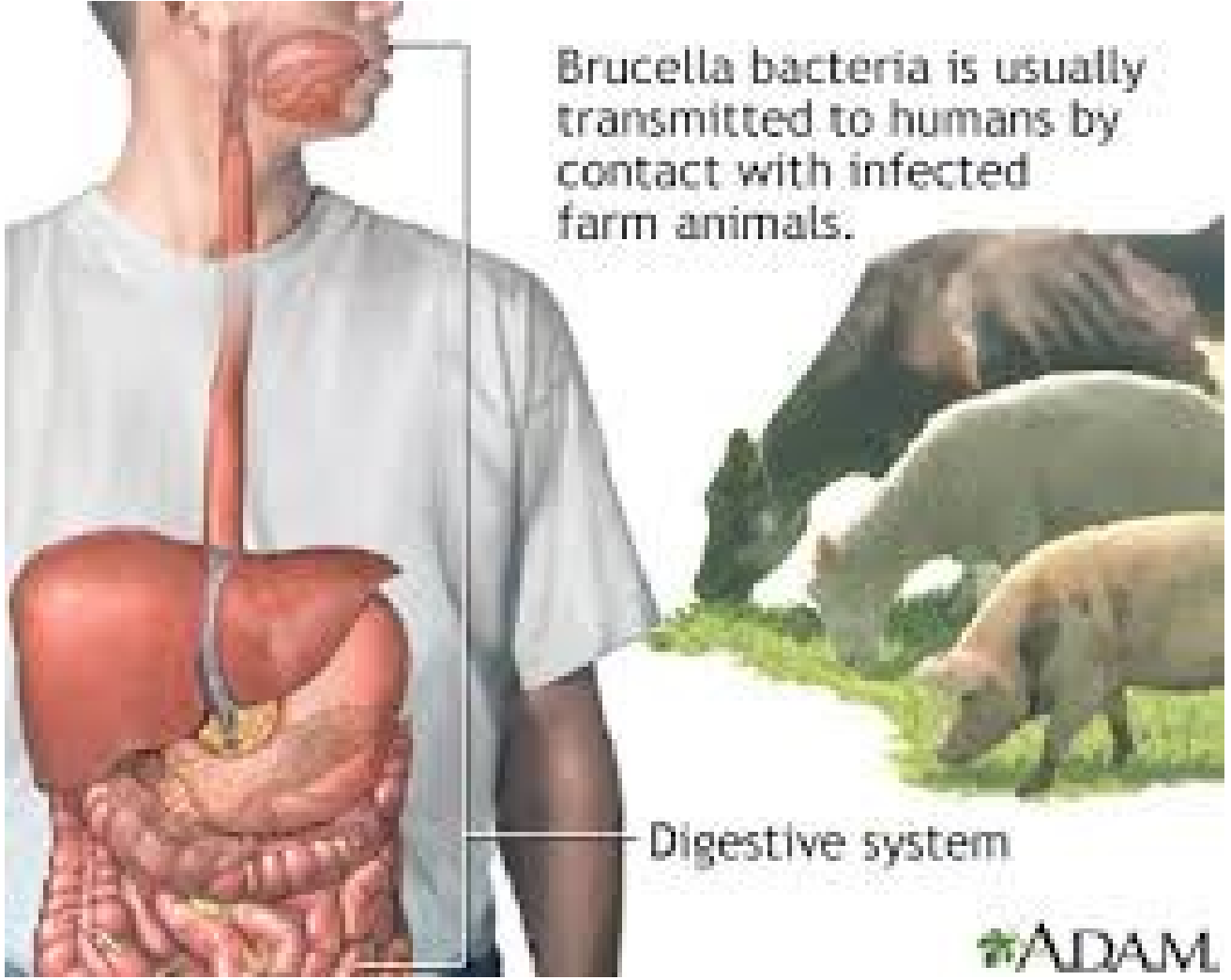
TRANSMISSION

- ACCIDENTAL INOCULATION: accidental needle strick injury during vaccination process.also in lab worker working with culture
- DIRECT CONTACT:

  Contact with infected animals and direct inoculation through cuts/ skin abrasion
- Direct conjunctival inoculation
- INHALATION:

  Inhalation of infected aerosol
- INGESTION:

  Ingestion of infected meat,milk,cheese
- Venereal transmission has been suggested but DATA not conclusive


Brucella bacteria is usually transmitted to humans by contact with infected farm animals.
Digestive system
A.D.A.M.

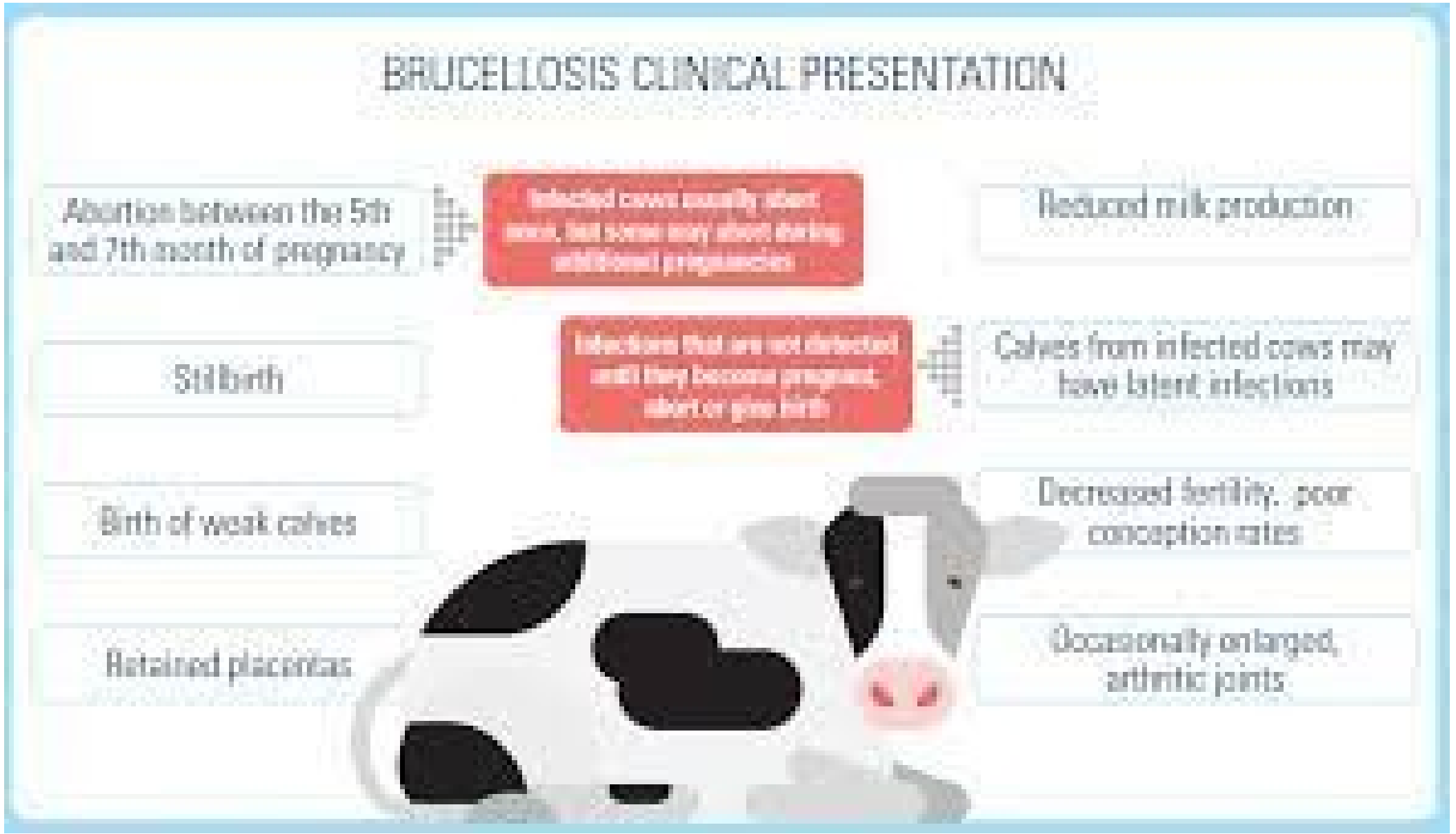
CLINICAL MENIFESTATION

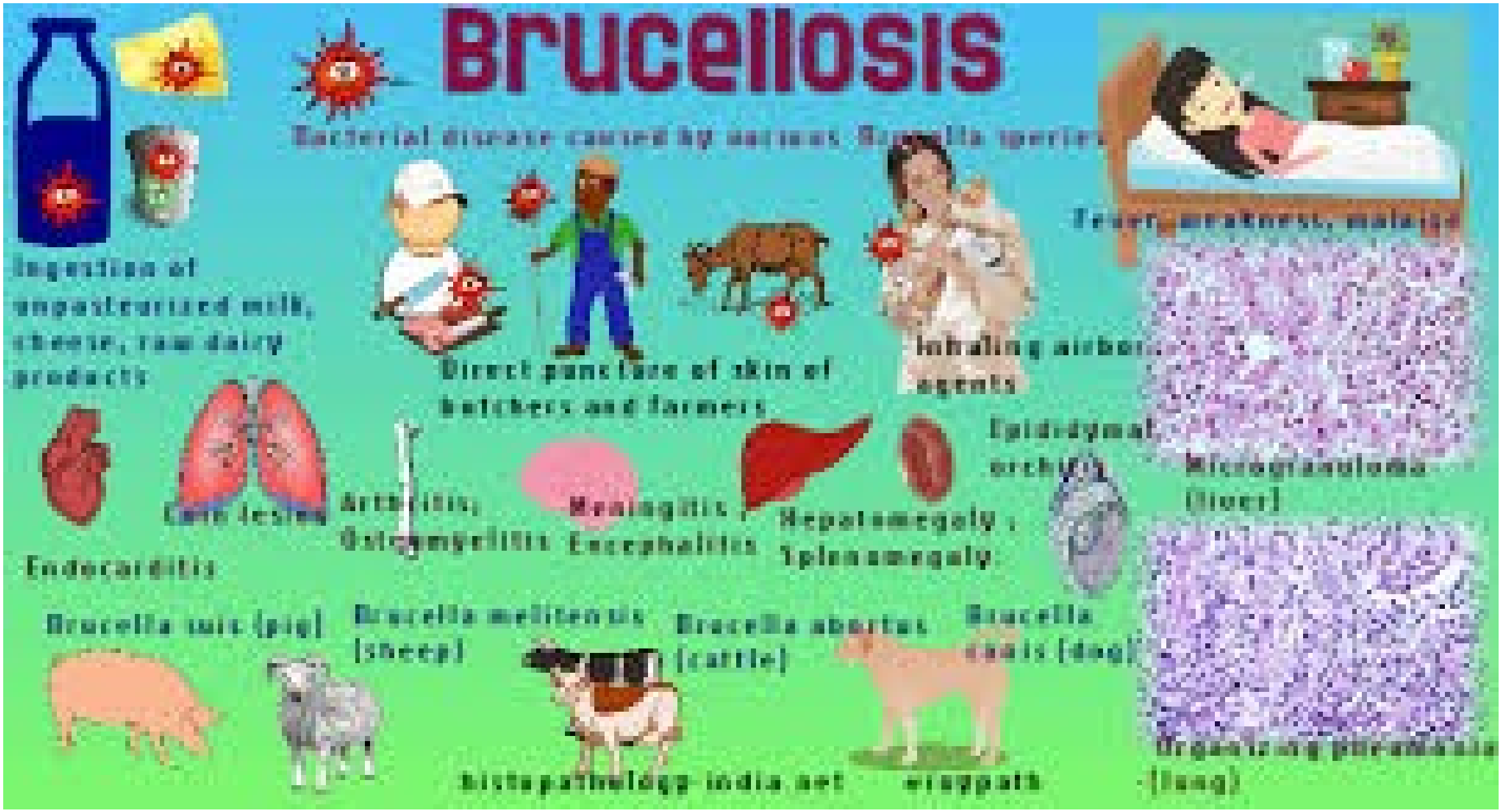
1. **ACUTE PHASE:** influenza like symptoms

- fever
- headache
- sweating/ fatigue
- limbs/ back pain
- Anorexia/weight loss
- depression

CHRONIC PHASE

- It is usually non bacteremic
- sweating
- Joint pain
- Symptoms persist for 3-4 months or usually for a year


BRUCELLOSIS CLINICAL PRESENTATION
Abortion between the 5th and 7th month of pregnancy
Stillbirth
Birth of weak calves
Retained placentas
Infected cows usually abort once, but some may abort during additional pregnancies
Infections that are not detected until they become pregnant, abort or give birth
Reduced milk production
Calves from infected cows may have latent infections
Decreased fertility, poor conception rates
Occasionally enlarged, arthritic joints


Brucellosis
Bacterial disease caused by various Brucella species
Ingestion of unpasteurized milk, cheese, raw dairy products
Direct puncture of skin of butchers and farmers
Inhaling airborne agents
Fever, weakness, malaise
Endocarditis
Arthritis, Osteomyelitis
Meningitis, Encephalitis
Hepatomegaly, Splenomegaly
Epididymal orchitis
Microgranuloma (liver)
Brucella suis (pig)
Brucella melitensis (sheep)
Brucella abortus (cattle)
Brucella canis (dog)
Organizing pneumonia (lung)

COMPLICATIONS

- Arthritis, meningitis, spondylitis
- Endocarditis
- Chronic debilitating illness

TREATMENT

- Vaccination for live stock
- No vaccine is available for humans
- An extended course of antibiotics is recommended
- Combination of tetracyclines and doxycyclines
- Combination of doxycycline with rifampine

PREENTION /CONTROLL

HUMANS

- Limit exposure to infected animals/byproducts
- Consume properly cooked meat
- Use pasteurized/boiled milk and dairy products from cow, sheep and goats
- Proper hygienic measures for workers who are in contact with animals on daily basis
- Provide instructions for infection control practices to minimize risk of exposure
- If infection is detected in an individual.an antibiotic course for recommended time is given
- Sometimes surgery is required
- Full recovery is common

ANIMALS

- To prevent brucellosis in animal herd always keep the newly purchased animal isolated
- Lab techniques to identify cause of abortion in animal to identify the sick one
- Proper disposal of placenta and non viable fetuses
- Hygiene and precautionary measures should be adopted
- Proper vaccination of animals specially in sexually immature females

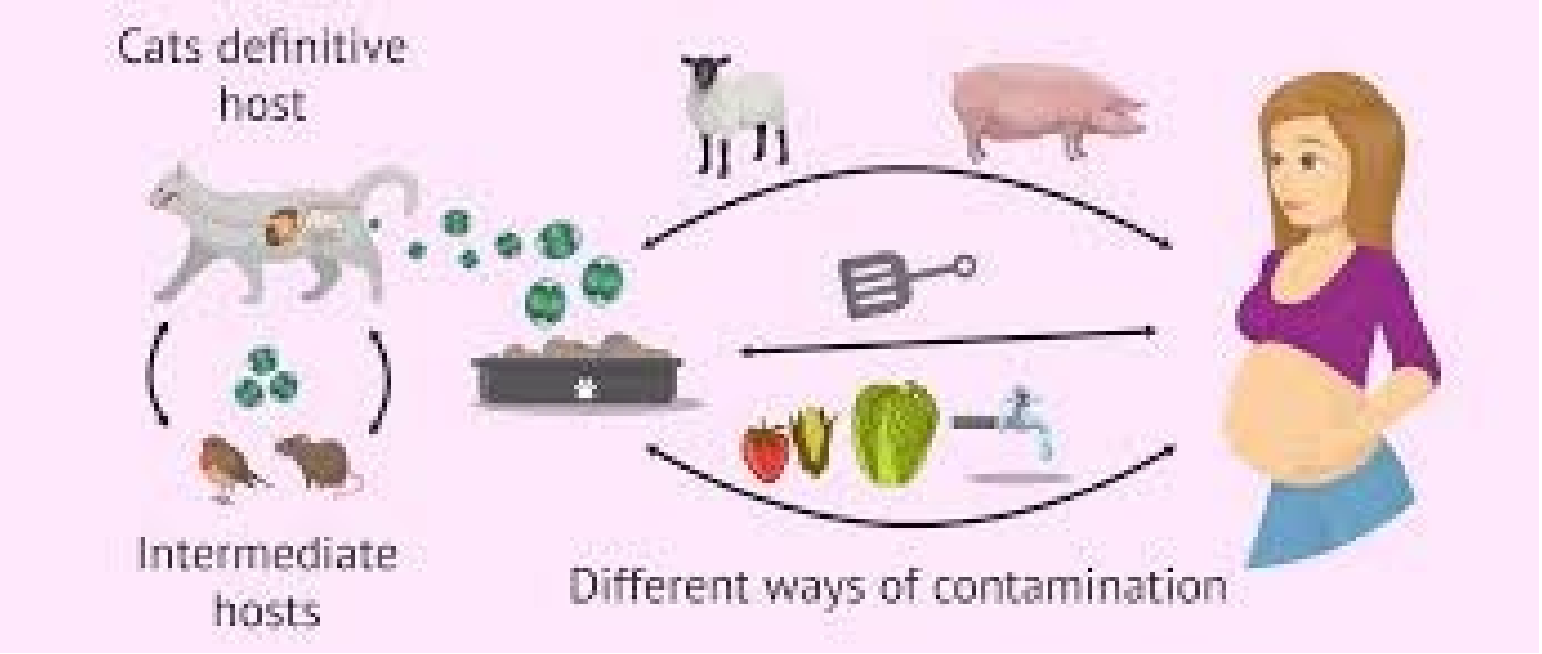
TOXOPLASMOSIS

- A zoonotic disease
- Caused by coccidian protozoan toxoplasma gondii
- It infects a wide range of animal but does not appear to cause disease in them

- Toxoplasmosis is a disease of blood and lymphatic system
- Cats are critical part of life cycle/definite host
- Intermediate hosts are a variety of animals
- Caused by eating undercooked meat
- Can also be caused by contact with cat faeces

PREGNANCY COMPLICATION

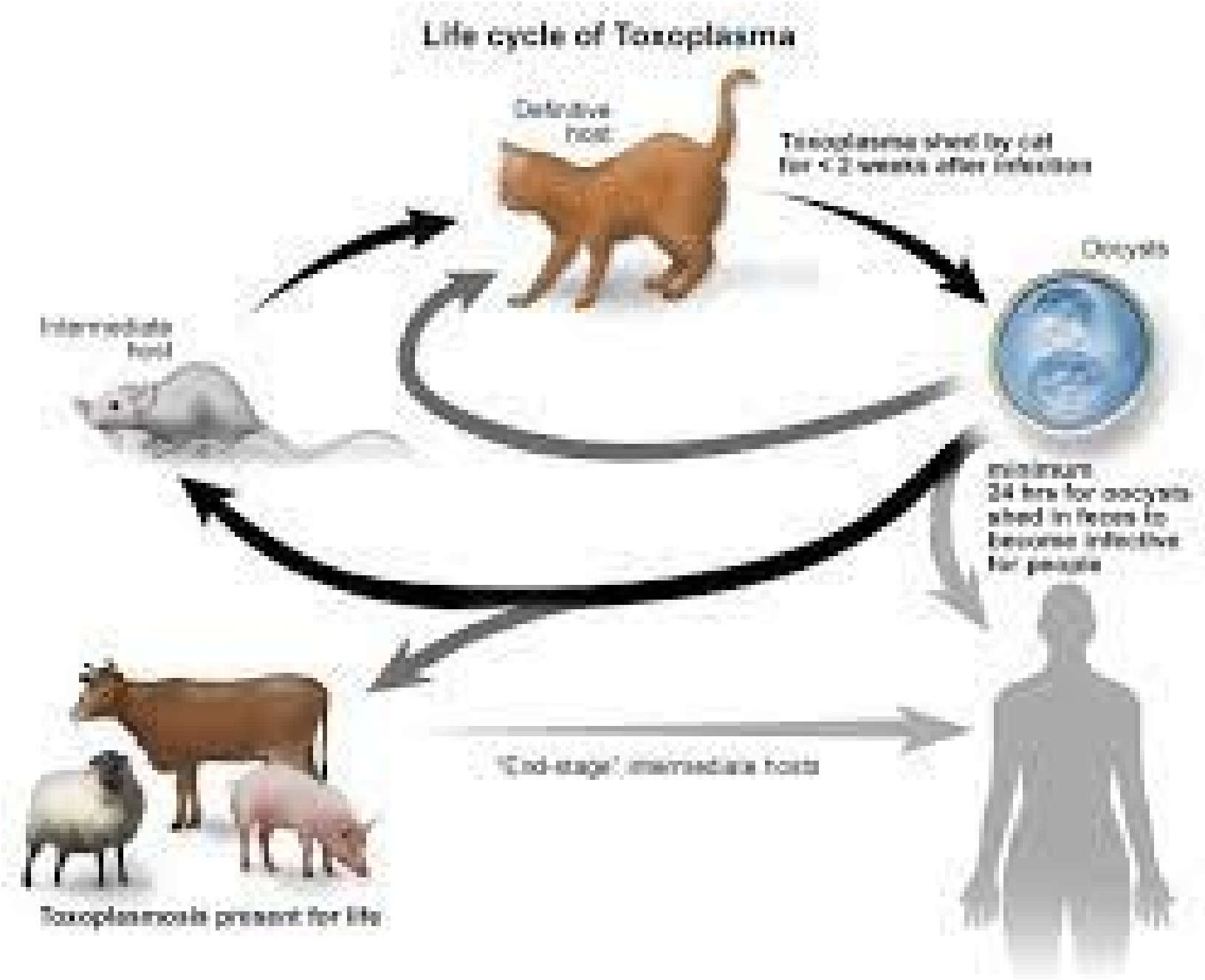
- primary problem is a congenital infection of fetus, resulting in either a child with severe brain damage or vision problem or still born



PATHOGENESITY IN HUMAN

- The normal final host is cat and relatives in family Felidae
- Only hosts in which oocyst producing sexual stage of toxoplasmosis can develop
- When a person ingests sporozoites it causes infection and reproduces a sexualy
- The oocyst opens in duodenum and releases sporozoites which pass through the gut wall
- They circulate in body and invade various cells

- They invade the lymph nodes and specially macrophages
- They further multiply and spread the infection to lymph nodes and other organs
- This initiates the acute phase
- They penetrate new cells as eye and brain
- Further development slows down to form the chronic stage


Life cycle of Toxoplasma
Definitive host
Toxoplasma shed by cat for < 2 weeks after infection
Oocysts
Intermediate host
minimum 24 hrs for oocysts shed in feces to become infective for people
'End-stage' intermediate hosts
Toxoplasmosis present for life

COMPLICATIONS IN HUMANS

- CONGENITAL TOXOPLASMOSIS

Develop in fetus of non immune mothers during pregnancy

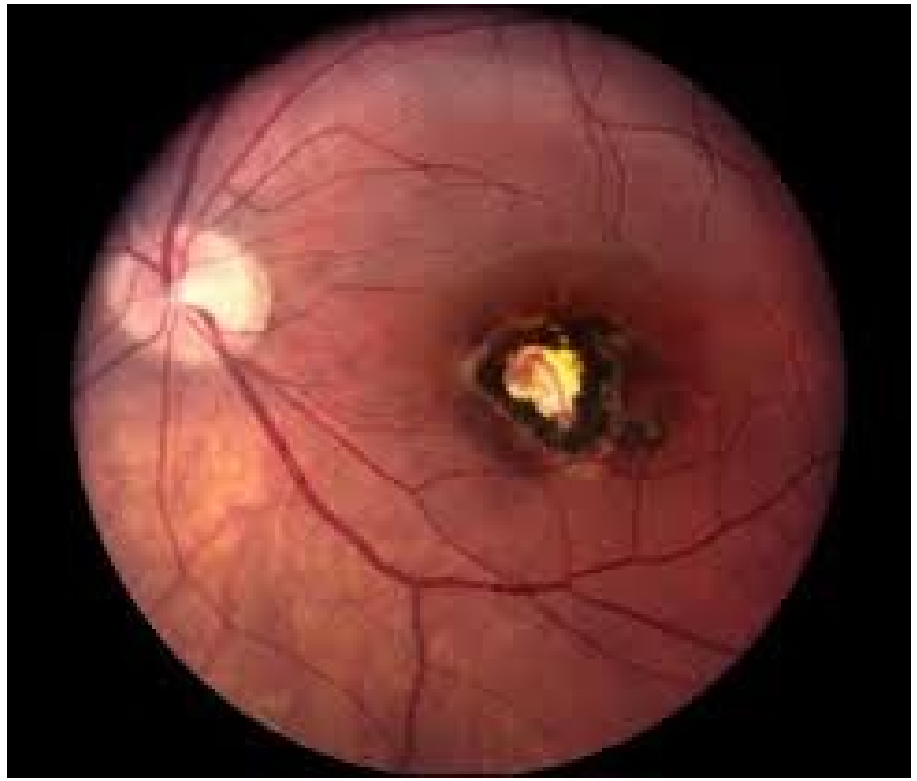
- POST NATAL TOXOPLASMOSIS

It is less severe

CONGENITAL INFECTION

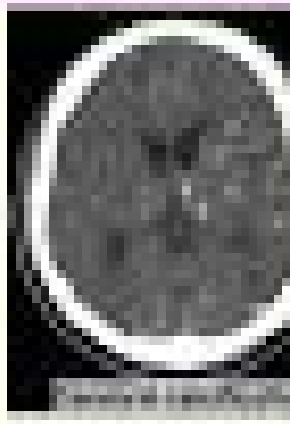
leads to

1. Stillbirth
2. Chorioretinitis
3. Psychomotor disturbances
4. Hydrocephaly
5. Microcephaly
6. Blindness
7. Congenital defects



Congenital

toxoplasmosis



INFECTIONS IN IMMUNO COMPROMISED

- Severe infection in patients with AIDS
- In immunosuppressed persons

Retinitis

Chorioretinitis

Pneumonia

Other non specific menifestations

TREATMENT

- Combination of pyrimethamine and sulphadiazine
- Spiramycin
- Clindamycin
- Trimethoprim-sulphmethoxazole
- IN PREGNANCY : spiramycin

CONTROL

- Avoid human contact with cat feces
- Change of cat litter and safe disposal can prevent transmission
- Pregnant women should avoid contact with kittens


Nanotechnology
Vaccination
Chemotherapy
Toxoplasmosis
Immunotherapy
Public education
Food and water safety

SCREENING OF PREGNANT WOMEN

- Periodic screening of pregnant women with high risk for IgG and igM antibodies to toxoplasmosis is recommended

FOOD/MEAT

- Avoid eating raw or undercooked meat
- Freeze below -20
- Heating at 50 degree for 4-6 minutes destroy the cysts

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