Caseous lymphadenitis

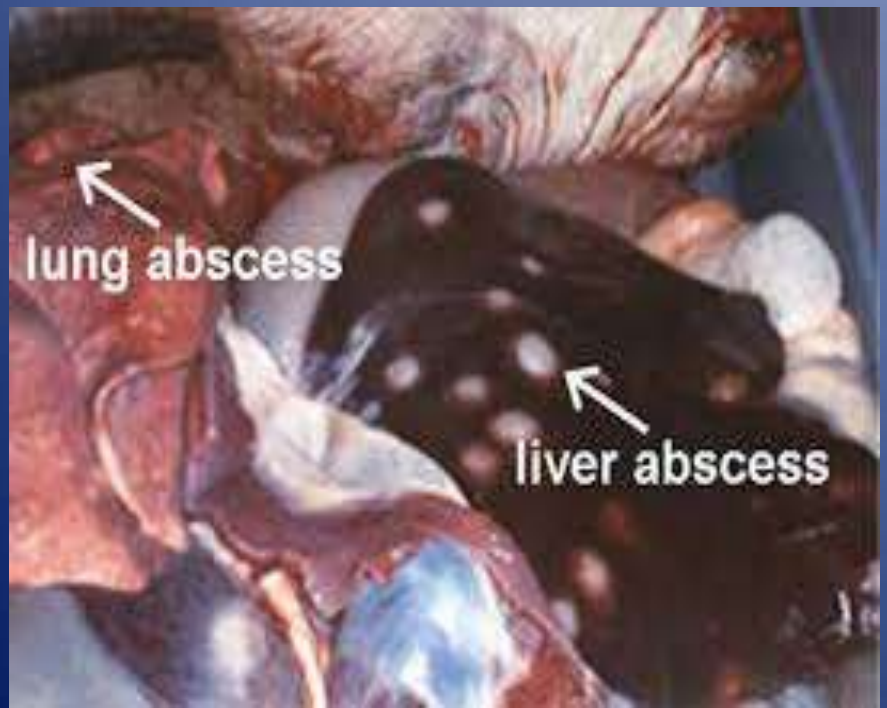
Corynebacterium ovis

(C. pseudotuberculosis)

- It is a chronic, contagious disease caused by the bacterium *Corynebacterium pseudotuberculosis*. CL occurs worldwide.

The disease is characterized by

- Abscess formation in or near major lymph nodes (external form).
- Or in the thorax and abdomen (internal form form).



- *Etiology and pathogenesis:* *C.pseudotuberculosis* is a gram-positive, facultative intracellular short rods(cocco-bacillus) they may be mistaken for a coccus.
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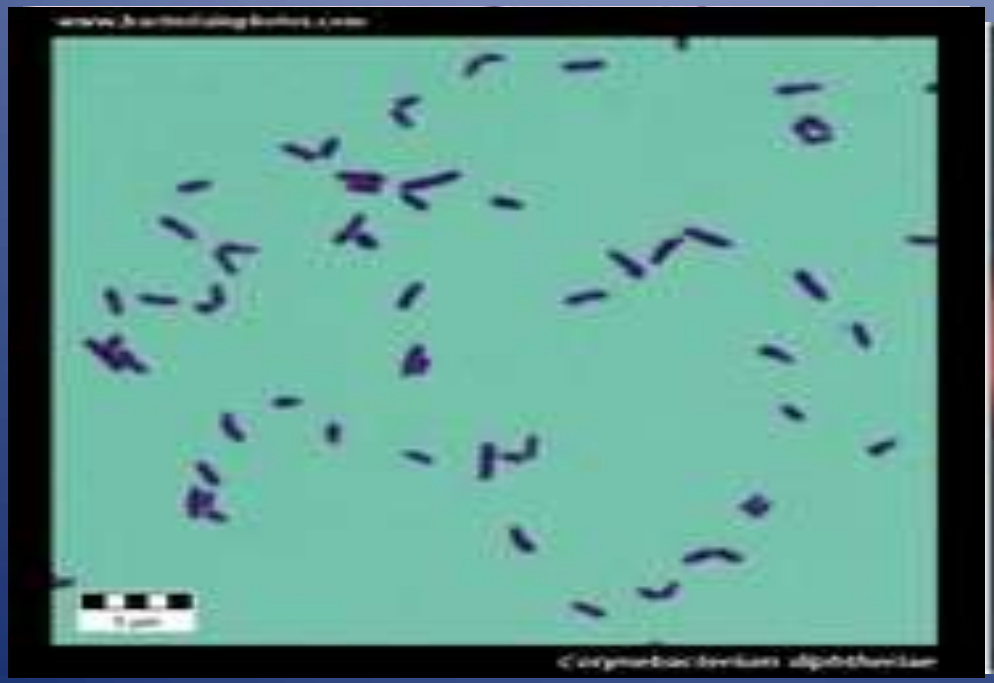
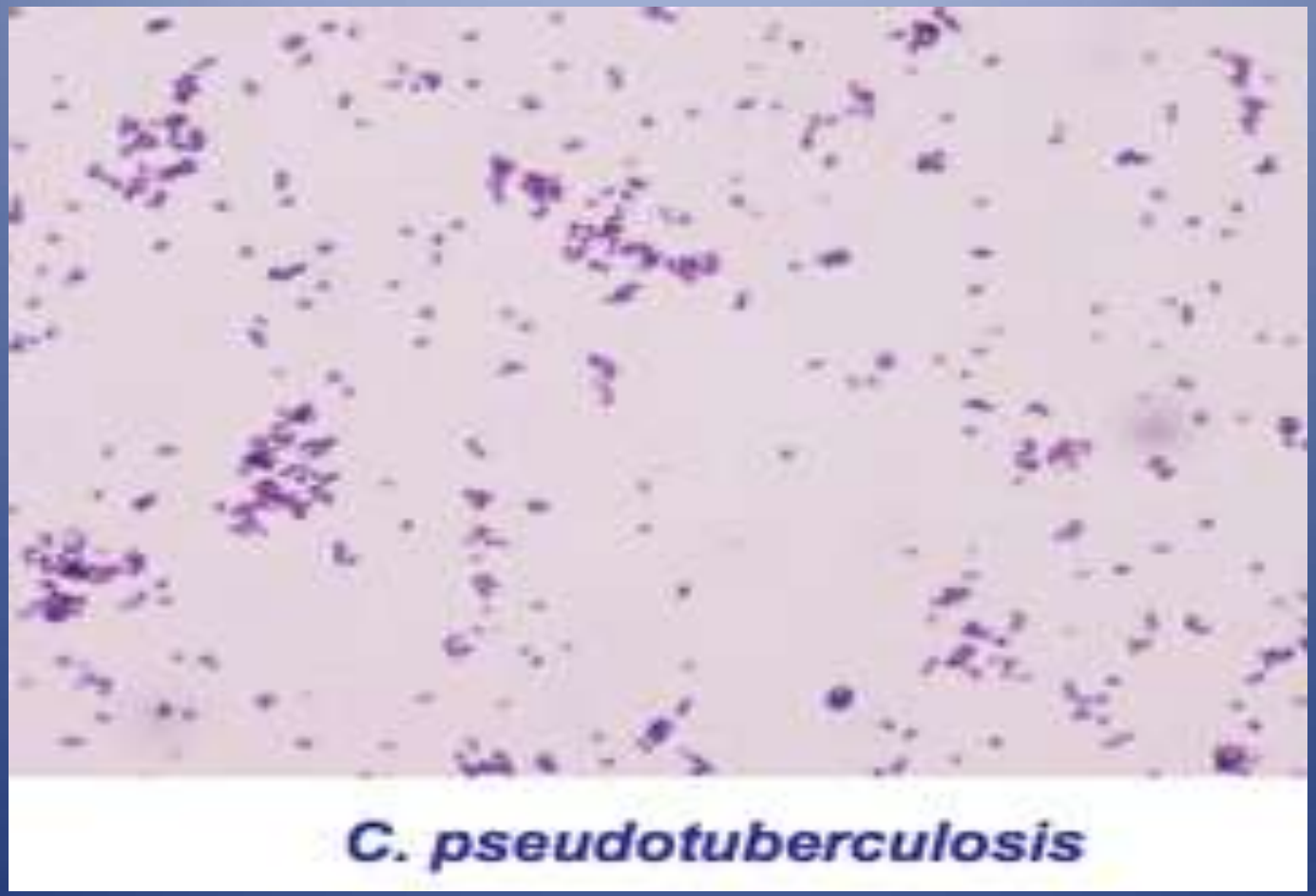
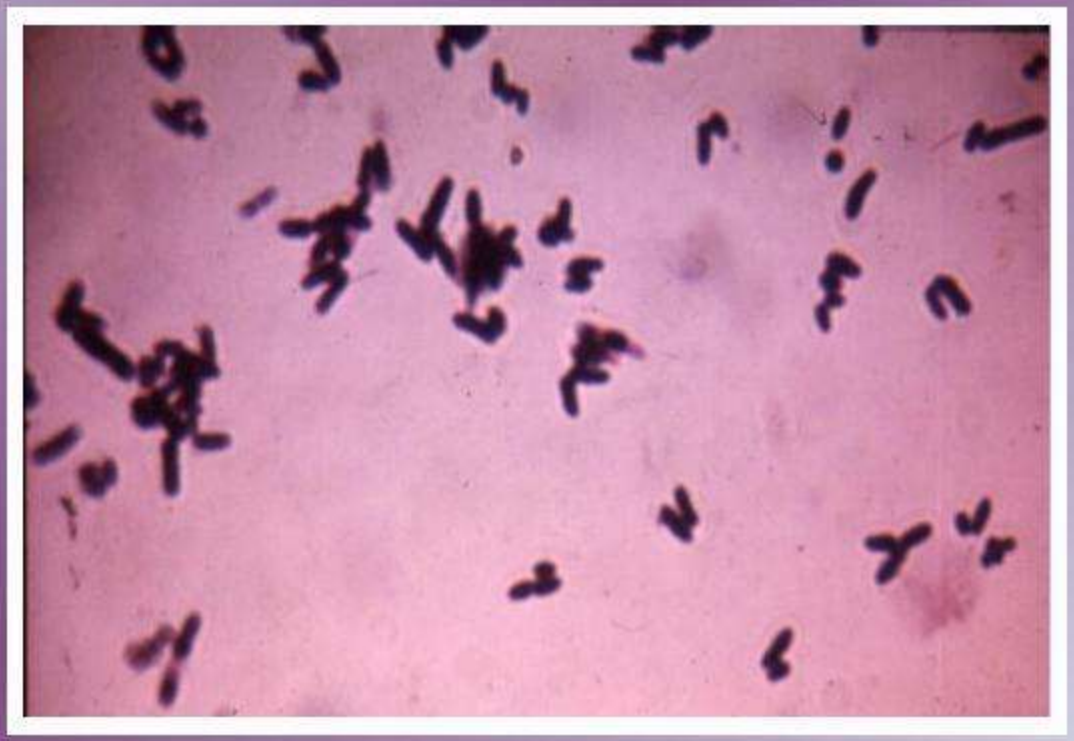
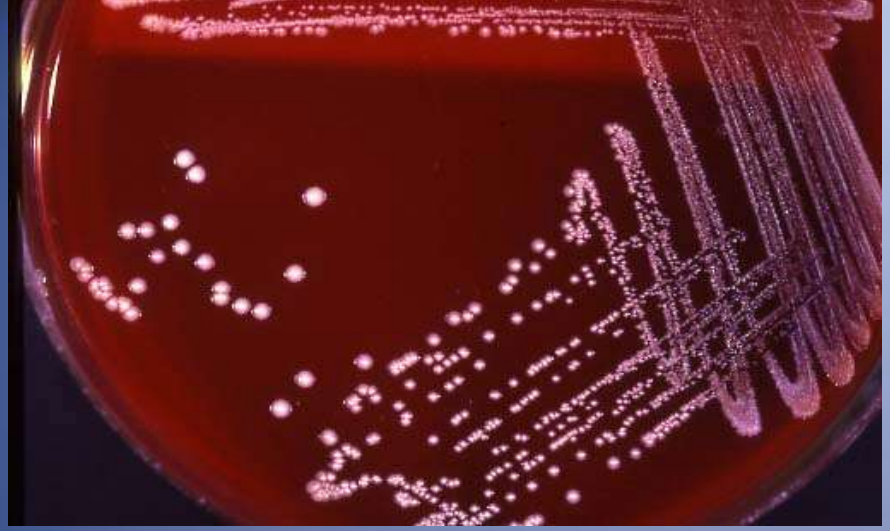




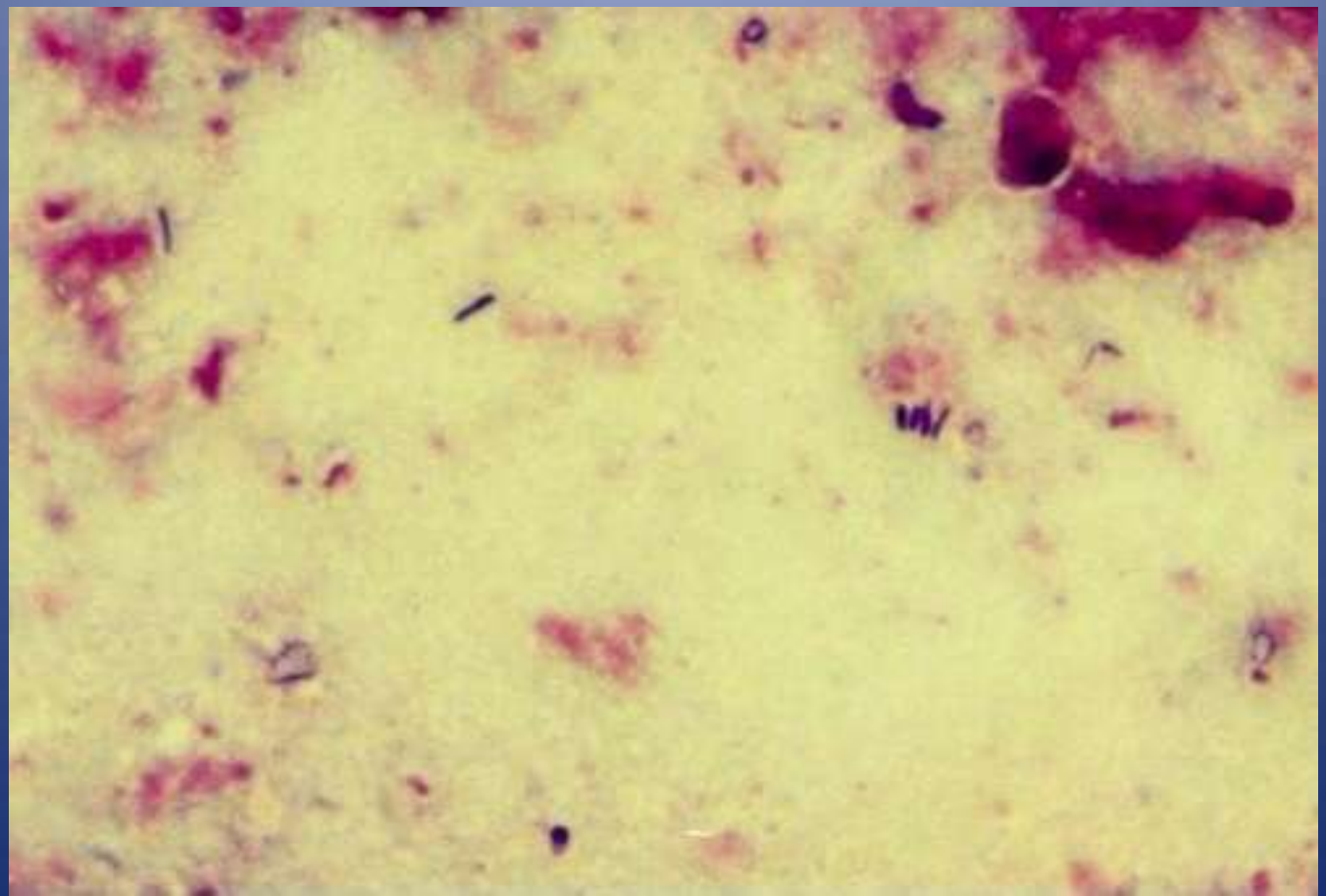
C. pseudotuberculosis

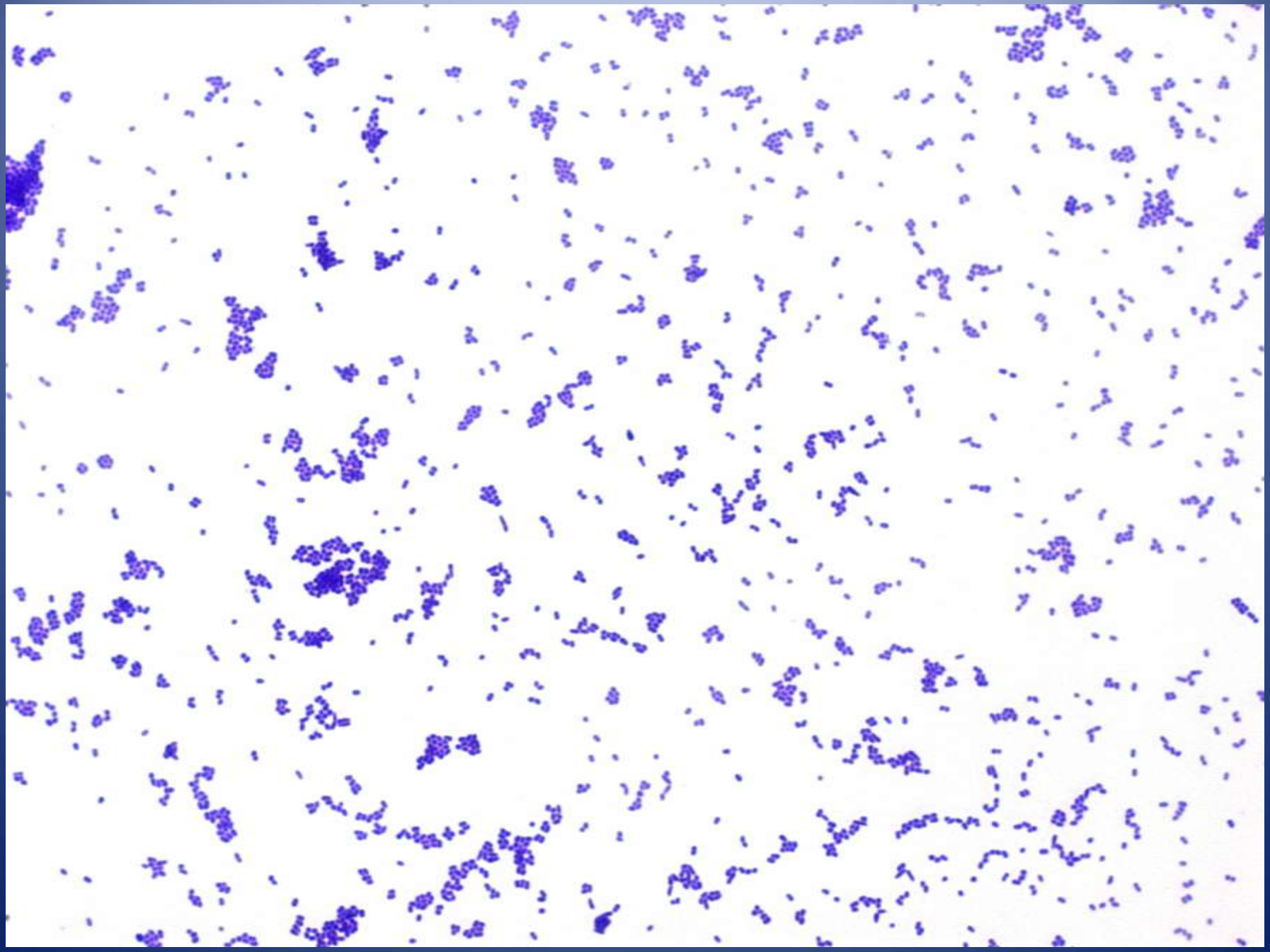
Corynebacterium pseudotuberculosis






abscess





Two biotypes have been identified based on the ability of the bacteria to reduce nitrate:

- a nitrate-negative group that infects sheep and goats,
- and a nitrate-positive group that infects horses.
- Isolates from cattle are a heterogeneous group.

- All strains produce an exotoxin called Phospholipase D that enhances dissemination of the bacteria by:
  *damaging endothelial cells and
  *increasing vascular permeability.
- The bacterium has a second virulence factor, an external lipid coat that provides protection from hydrolytic enzymes in host phagocytes.

Replication of bacteria occurs in the phagocytes, which then rupture and release bacteria. The ongoing process of bacterial replication, followed by attraction and subsequent death of inflammatory cells, forms the characteristic abscesses associated with CL.

CL abscess in a parotid lymph node is near to rupturing.

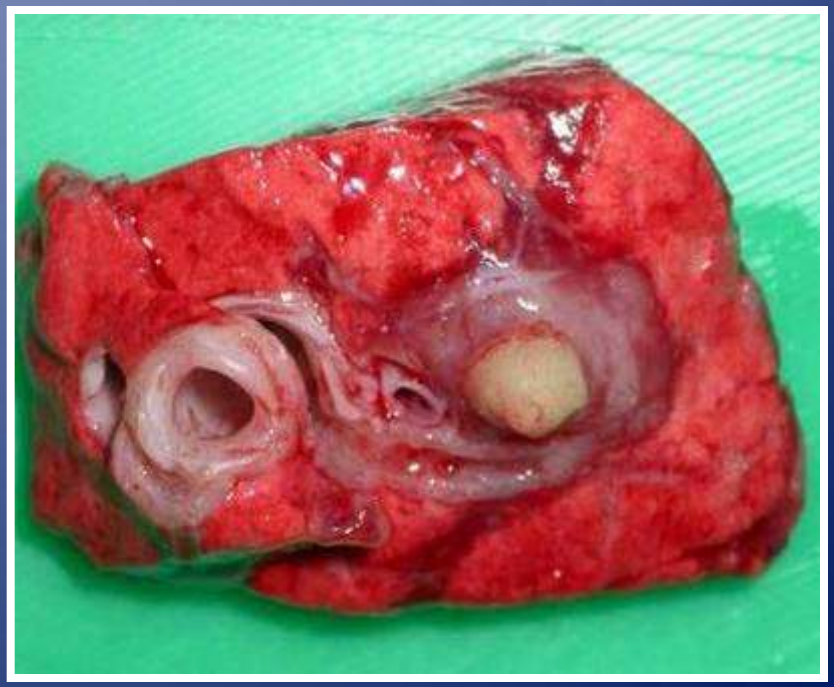
- Caseous lymphadenitis in intra-

Transmission

- Through contamination of injured mucous membranes, skin wounds, abrasions (shearing, fighting, castration, dipping).
- Bites of flies - Pus contains millions of bacterial cells
- Aerosol route of disease transfer also suggested.

Aerosol transmission?

- Disease spread in absence of external abscesses.
- *C. Pseudotuberculosis* cultured from trachea of infected sheep; this is a Potential for coughing to aerosolise pus.



Pathogenesis: Cutaneous form

- From point of entry---------- drains to local drainage lymph node ------Cells are phagocytosed as part of innate immune response – survive and replicate within macrophages---------- Focus of infection established within lymph node ----------Multiple microscopic foci coalesce to form pyo granuloma ----------Lesion encased within fibrous capsule--------- Infiltration of immune cells forms caseous abscess---------- Classic “onion ring” appearance

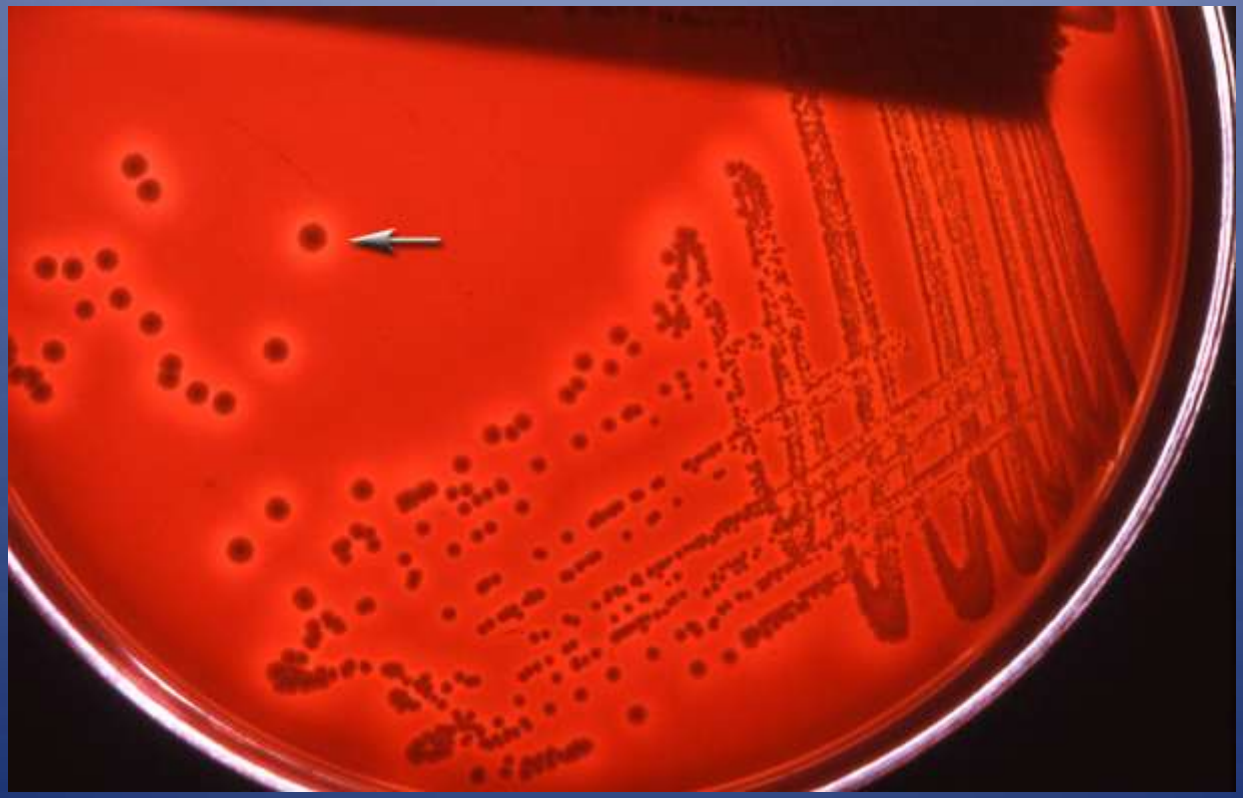
Colonies of C. pseudotuberculosis on blood agar

- Visceral form; Trafficking of infected phagocytes to other tissues allows dissemination of infection------ Visceral CL (25%): lungs, kidneys, brain, internal lymph nodes. Mediastinal abscesses place pressure on trachea → restricted rumination → chronic wasting.

Ovine kidney- caseated abscess

- *Animals affected:* CL is primarily a disease of sheep and goats, but it occurs sporadically in horses, cattle, camelids, swine, water buffalo and wild ruminants.
- *Zoonosis:* CL occurs occasionally in people, so appropriate precautions should be taken when handling infected animals and purulent exudate from lesions.

- *Economic losses*: Arise from condemnation and trim of infected carcasses, decreased leather and wool yield, culling of infected animals, loss of sales of breeding stock, and deaths from internal involvement.



Clinical Findings

* CL is a chronic, recurring disease. One to 3 mo after inoculation of the bacteria, an encapsulated abscess slowly forms at the point of entry into the skin or in a nearby lymph node.

*Initial infection is subclinical in some animals but can also be associated with fever, anorexia, and cellulitis at the infection site.

*Infection can spread in blood or lymph to internal lymph nodes and to viscera such as the lungs, kidney, liver, uterus, and brain. Less common sites of involvement include the udder, scrotum, and joints.

Abscesses and pyogranuloma

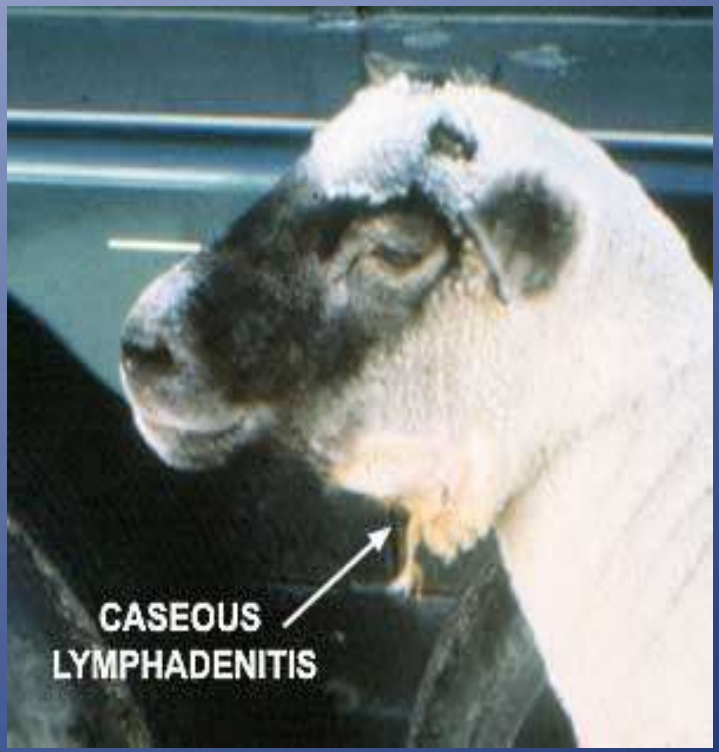
common in the liver of sheep and goats

- * Sheep and goats differ somewhat in the distribution of abscesses, possibly as a result of management differences. External abscesses around the head and neck occur more commonly in goats, while the visceral form is more common in sheep.
- Internal abscesses should be considered as a potential diagnosis for "thin ewe" syndrome, or (wasting ewe syndrome) in which an adult small ruminant loses condition in the face of adequate nutrition.

- These multiple abscesses in a sheep spleen were caused by *Corynebacterium pseudotuberculosis.* This is a common cause of "wasting ewe syndrome.

Caseous abscess filled with greenish-yellow pus in the abdominal muscles.

Cutaneous CL is more common in goats


CASEOUS
LYMPHADENITIS

Treatment:

- Antimicrobials; although *C pseudotuberculosis* is susceptible to penicillin in vitro, treatment is not necessarily effective in vivo because the antibiotic cannot penetrate into the abscesses well.
- Long-term (4–6 wk) penicillin (22,000 IU/kg, IM, bid) and Rifampin (10–20 mg/kg, PO, sid) has been used to treat the internal form of CL with limited success.

- Surgical treatment; an intact abscess should be surgically removed. Alternatively, external abscesses can be lanced and drained, and the abscess cavity lavaged with dilute iodine solution. The purulent material should be collected into a disposable container and incinerated.
- The surgeon should wear disposable gloves to avoid inadvertent self-inoculation.
- The treated animal should be isolated from other small ruminants until the wound is healed.

- *Lesions:* In sheep, the abscess often has the classically described laminated “onion-ring” appearance in cross section, with concentric fibrous layers separated by inspissated caseous exudate. In goats, the abscesses are less organized, and the exudate is usually soft and pasty.

*Superficial abscesses eventually rupture and discharge infectious purulent material into the environment.

*The skin wound heals, leaving a scar. Abscesses tend to recur months to years later.

Control:

a. Tell the owner about the persistent, recurrent nature of the disease.

b. Cull infected animals from the herd, housed separately from the uninfected "clean" animals in a separate area. animals with draining abscesses should not be sent through sale barns until draining has ceased and the wound has healed.

d. Vaccination of young replacement stock reduces the incidence and prevalence of CL within a flock, but it will not prevent all new infections or cure infected animals.

Currently, all contain Phospholipase D toxoid, and some also contain killed whole bacterial cells. Increasing the frequency of vaccination to every 4–6 mo may be of benefit in flocks in which exposure is high. Use of the vaccine in goats is associated with poorer efficacy and more adverse reactions (eg, decreased milk production, fever, malaise, ataxia, ventral edema, and occasionally death).