

Diagnosis of Bovine Mastitis

Hanan Yousef Jassim

Clinic

4th Class

Mastitis

- **Mastitis is defined as** inflammation of parenchyma of mammary gland characterized by physical and chemical changes in milk and pathological changes in the tissue of mammary gland.
- The inflammation is most commonly a **pathophysiological response** to the invasion and multiplication of micro-organisms, usually bacteria, but it could also be caused by chemical or mechanical injury.

Clinical Classification of Mastitis

```
graph TD; A[Clinical Classification of Mastitis] --> B[Clinical]; A --> C[Subclinical]; B --> D[Severity]; D --> E[Per acute]; D --> F[Acute]; D --> G[Subacute]; D --> H[Chronic];
```

Clinical

Subclinical

Severity

- **Per acute**
- **Acute**
- **Subacute**
- **Chronic**

Clinical signs of Mastitis

Clinical Mastitis

Local

- Heat
- Swelling
- Pain
- Redness
- Disrupted function

Systemic

(per acute and acute)

- Fever
- shivering
- Loss of appetite
- Depression



Clinical signs of Mastitis

Subclinical Mastitis

- **Absence of any visible signs.**
- **Only decreased milk production.**



Diagnosis of Mastitis

- ❖ **Examination of Udder**
- ❖ **Examination of Milk**

Diagnosis of Mastitis

Examination
of Udder

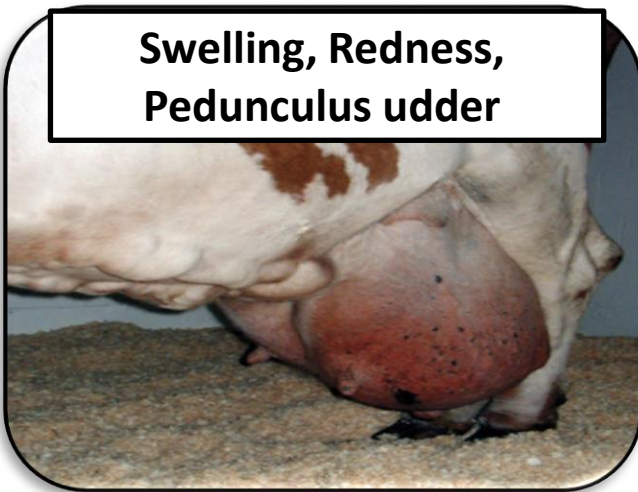
⑩ Inspection

⑩ kin, Size, Symmetry of Udder and Teats, Teat Injury and Supernumerary teat

⑩ Palpation

⑩ Consistency, Pain, Heat, Teat Canal, Teat orifice and Supramammary Lymph Node

Swelling, Redness,
Pedunculus udder



Teat injury



Diagnosis of Mastitis

Examination of
Milk

- ⑩ Physical Examination
- ⑩ Chemical Examination
- ⑩ Microscopic Examination
- ⑩ Bacteriological Examination
- ⑩ Biochemical Test

Physical Examination

- **Color, Odor and Consistency**
- **Strip cub test**



Chemical Examination

- pH (normal milk pH 6.4-6.8)
- Chloride test (normal 0.08-0.14)
- Electrical conductivity (Na⁺, Cl⁻)

Draminski Mastitis Detector

A device for detecting sub-clinical mastitis in its earliest, visually undetectable stage.



California Mastitis Test

- Is a simple, inexpensive, and rapid cow side test that used widely for the diagnosis of mastitis. This test has high sensitivity for the number of somatic cells.

California Mastitis Test Scores
Correlation of CMT Score with Somatic Cell Count

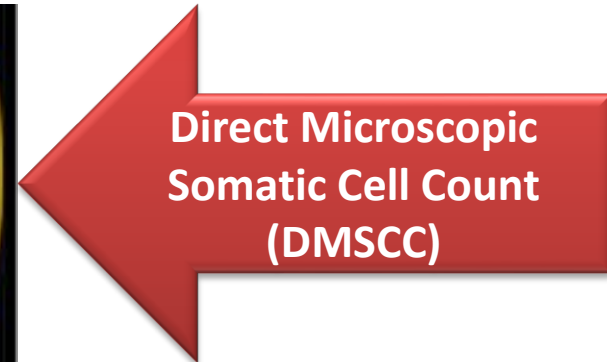
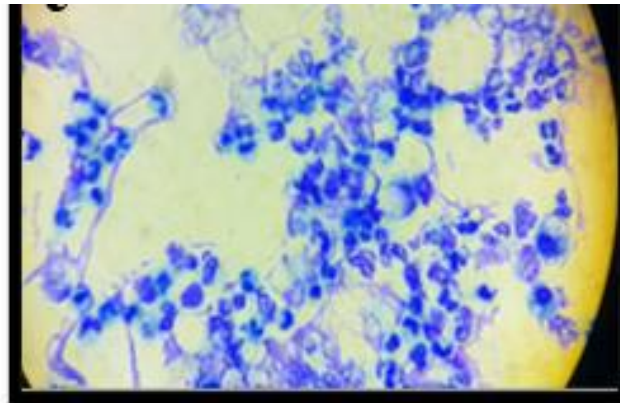
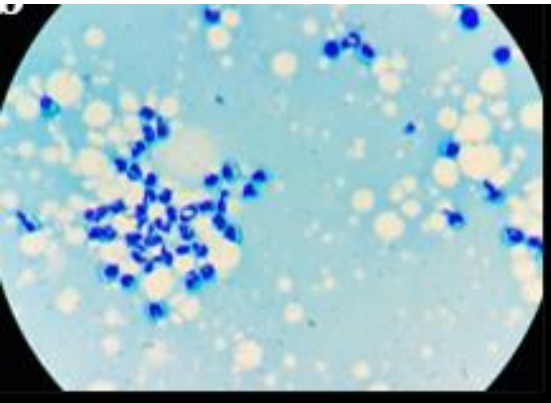
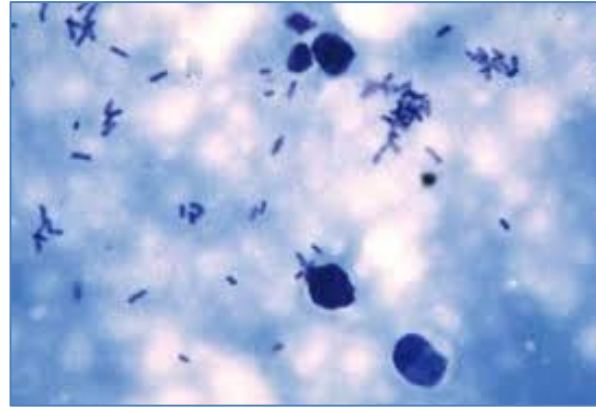
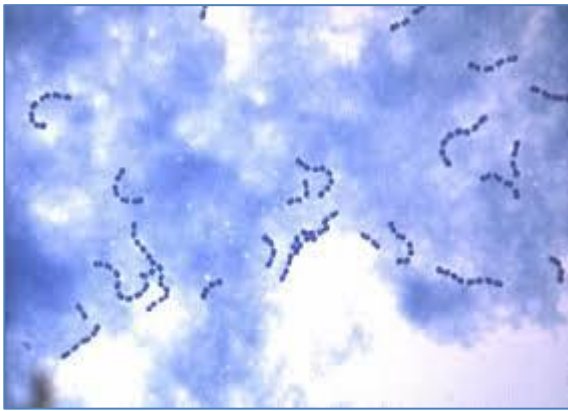
CMT Score	Somatic Cell Range		
N	0	to	200,000
T	200,000	to	400,000
1	400,000	to	1,200,000
2	1,200,000	to	5,000,000
3	Over 5,000,000		



Microscopic Examination

- Microscopic examination of the milk is one of the most effective methods of rapid investigation of the presence of **bacteria** and **leukocytes** in milk.
- It is possible to determine the number and morphological characteristics of the causative bacteria in addition to the number of leukocytes (somatic cell) in milk, which are known as direct microscopic count (DMC) and direct microscopic somatic cell count (DMSCC).

Microscopic examination



Bacteriological examination

- **Milk samples cultured on either selective or differential media.**
- **The selection of the appropriate culture medium depends mainly on the type of suspected bacteria, the most common culture media used for bacteriological examination of milk samples are blood agar, MacConkey agar, Edward's medium, Mannitol salt agar and glycine-tellurite agar.**

Staphylococcus aureus



Beta-hemolysis on blood agar

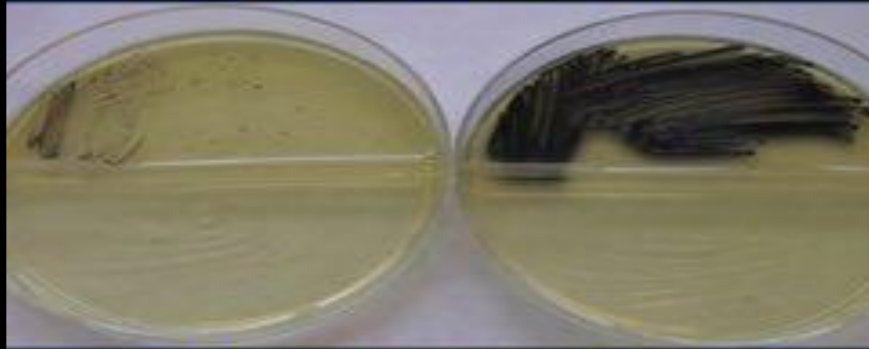
Staphylococcus epidermidis



Staphylococcus aureus

Mannitol Salt Agar

***S. aureus* on Tellurite-Glycine Agar**



S. epidermidis

S. aureus

MacConkey agar



Lactose fermenting colonies

Non-lactose fermenting colonies

Biochemical Test

- **Lactose and Total Proteins.**
- **Enzymes activity:**

Catalase, glutathione peroxidase, Aspartate Aminotransferase, lactoperoxidase, Alkaline Phosphatase and Lactate Dehydrogenase.

- **Level of minerals and ions:**

Na, K, Cl, Ca, P, Mg and Fe

