Microorganisms in Dairy Products

I. Cheeses.
II. Yoghurt.
III. Lipid dairy product.

*__Cheeses:-__ is the hard product of milk. It is produced by the addition of lactic –acid bacteria as a starter or the addition enzymes or acids followed by processes to give the texture & flavor of chesses.

Classification of cheese:

Soft: moisture content 40-80%
Semi-soft: moisture content 30-40%
Hard: moisture content 30%.

Spoilage of cheese

Depend on:
1-Type or kind of chesses.
2-The moisture content.
3-Tempreture.
4-Period of storage.

The most important genera of bacteria which contaminate cheese:

-*Coliforms: from animal or human causes acids & gases.*
-Lactic acid bacteria causes sour flavor.
-Bacillus&Clostridium causes lipolyzation&proteolyzation of cheese.
-Pseudomonas & Proteus causes foul odor & slime.
-Cladosporium causes black or green color.

Procedure:

Aseptically , taken 10 gm from various parts from chesses & put into sterile container , transfer the contents into sterile mortar.

Mix with 90 ml diluted solution and shaken several times by mortar to obtain a 10^{-1} .the mixture is left for 3-5 min just before making serial dilution.

Laboratory tests

*White cheese

1- General microbes (aerobic plate count)

10^{-3} **1 ml (pour)/ 0.1 (spread)** → *Nutrient agar* → **37C° / 24hr**

2- Detection of the Coliform

10^{-1} **1ml (pour) / 0.1 (spread)** → *E.M.B* *MacConkey* agar → **incubation** → **37C° / 24hr**

E.M.B= *Eosin methylene blue*

3-Protelytic Bacteria:

10^{-2} **1ml (pour) / 0.1 (spread)** → Casein agar → **incubation** → **37C° / 24hr**

4-Mold & Yeast

10^{-1} **1ml (pour) / 0.1 (spread)** → **Yeast extract agar** **incubation** → **25-28C° / 48hr**

The most important genera of bacteria which contaminate yoghurt:

Colifrom , mold & yeast.

Laboratory tests

*Yoghurt

1-General growth (aerobic plate count):

10^{-4} **1 ml (pour)/ 0.1 (spread)** → **Nutrient agar** → **37C° / 24hr**

2-Mold & Yeast

10^{-2} **1ml (pour) / 0.1 (spread)** → **Yeast extract agar** **incubation** → **25-28C° / 48hr**

3-Coliform

10^{-2} **1ml (pour) / 0.1 (spread)** → **E.M.B** **incubation** → **37C° / 24hr**

*E.M.B= Eosin methylene blue

***Lipid Dairy Product**

A) Butter: Butter is less spoiled by M.Os because the butter contents of the high concentration lipid. The spoilage occur a result to moisture.

Laboratory tests

*Butter

1-General growth (aerobic plate count):

10^{-3} **24hr** → **1 ml (pour)/ 0.1 (spread)** → **Nutrient agar** → **incubation** → **37C° /**

2-Mold & Yeast

10^{-1} **1ml (pour) / 0.1 (spread)** → **Yeast extract agar** → **incubation** → **25-28C° / 48hr**

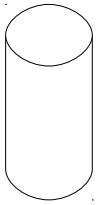
3-Detect Of the Lipolytic Bacteria

10^{-2} **24hr** → **1ml (pour) / 0.1 (spread)** → **B.F.A** → **incubation** → **30C° /**

*B.F.A=butter fat agar

Note: After incubation, covered the plate with a solution of copper sulfate $CuSO_4$ for 5min a period. Then the lipolytic bacteria appear with a halo Bluish green surround of the colonies.

4-Grossley Test

10^{-1} **1ml** →  **incubation** → **30C° / 24hr**

Grossly medium

The reagent (bromocresol purple)

Note: If the presence of microbial contamination in sample, after incubation of the tubes observes the production of acetic acid which changes the medium from the violet to yellow.

B) cream:

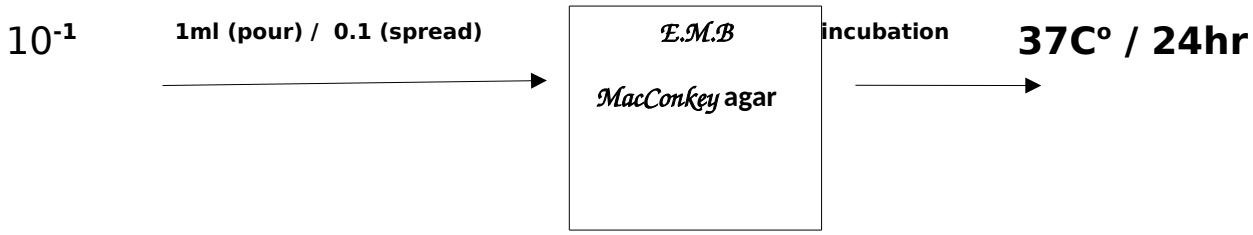
Laboratory tests

*cream

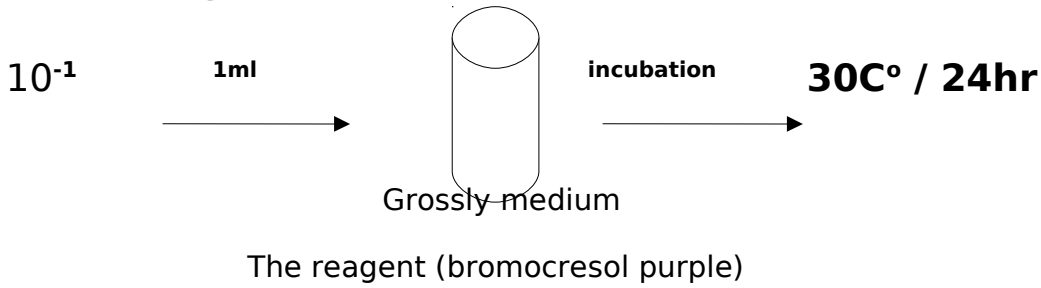
1- General growth (aerobic plate count)

10^{-3} **1 ml (pour)/ 0.1 (spread)** → *Nutrient agar* → **37C° / 24hr**

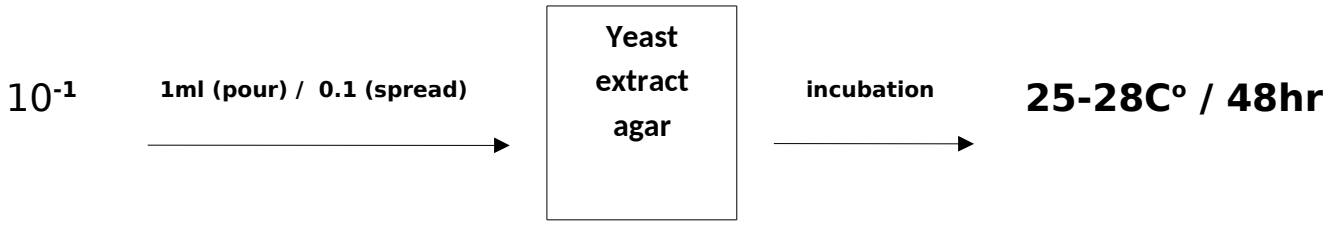
2- Detection of the Coliform



3-Grossley test:

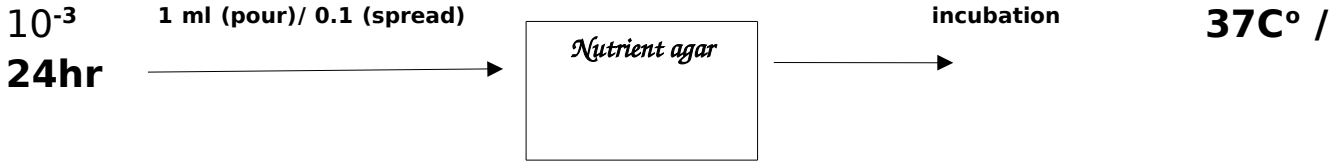


4-mold & yeast



c) Ice cream:

1- General growth (aerobic plate count)



2- Detection of the Coliform