**Factors affecting bacterial growth**

**Factors affecting bacterial growth are:**

1. Oxygen requirement.
2. Temperature requirement.
3. PH
4. Osmotic pressure (salt tolerance).
5. **Oxygen requirement:**

Bacteria are divided into four groups according to oxygen requirement:

1. Bacteria grow only in the presence of oxygen, called: **strict aerobes.**
2. Bacteria grow only in the absence of oxygen, called: **strict anaerobe**.
3. Bacteria grow in the presence or absence of oxygen, called: **facultative anaerobe**.
4. Bacteria grow in a little amount of oxygen, called: **micro aerophilic**

In our bodies:

- The aerobic places: skin, eye, mouth, throat, nose.

- The anaerobic places: deep in tissue, large intestine.

- The micro aerobic: upper part of stomach.

**How to achieve anaerobic condition:**

1. Anaerobic hood.
2. Anaerobic jar: use gas generating kit which contains chemicals to consume the oxygen present in the jar.
* We add 10 ml water to the gas kit.
* Chemial+H2O-----> H2 + CO2
* H2 + O2 (in jar) --catalyst---> H2O (appear as droplet in the jar)

**Catalyst:** use it to speed up the reaction between H2 and O2

**To check anaerobic condition we use:**

1- Chemical indicator:

Called: Redox dye.

It is a yellow strip and it turns green or blue in the presence of O2.

2- Biological indicator:

Use:

 Strict aerobic bacteria, if it didn’t grow that means= anaerobic condition.

Or we use:

Strict anaerobe bacteria, if it grows that’s mean = anaerobic condition

1. **Temperature requirement:**

Bacteria are divided into three groups according to temperature requirement:

1. Bacteria grow at cold temp. (4-10 ̊C), called: **Psychrophilic**.
2. Bacteria grow at 15- 45 ̊C, called: **Mesophilic (pathogenic bacteria).**
3. Bacteria grow at 45-90 ̊C, called: **Thermophilic**
4. **PH:**
* 1. Some bacteria grow at acidic PH (3-6), Called: **Acidophilic.**
* 2. Or grow at alkaline PH (8-10), Called: **Alkelophilic /basophilic**.
* 3. Most bacteria grow at neutral PH (7).
1. **Osmotic pressure:**

Bacteria vary in their tolerance to salt levels.

* 1. Some cannot tolerate high concentration of salt.
* 2. Other can tolerate medium concentration of salt.
* 3. Some can tolerate high concentration of salt, called: **halophilic.**