

- Depending on their requirements, bacteria need different media solutions to be grown in the laboratory:
 - **Agar media**
 - A **nutrient jelly**
 - **Most bacteria and fungi are grown on agar**
 - It is **commercially available** (Oxoid, Biomerieux)
 - The exact composition of it is known
 - In more complex agar media, the exact composition is a company secret
 - This is used to grow fastidious organisms
 - **Selective media**
 - This **inhibits the growth of some bacteria while allowing others to thrive**
 - Two examples are **Brilliant Green Agar** and **Eosin Methylene Blue**
 - The dyes **inhibit the growth of Gram-positive bacteria**
 - It is **useful for culturing GI bacteria** as they are **Gram-negative**
 - **Differential media**
 - This **differentiates between different organisms growing on the same plate**
 - An example is **blood agar**
 - This is agar with **5% sheep's blood** or **defibrinated horse blood introduced** into it
 - It is used to **differentiate between species of *Streptococci***
- Scientists may also have to count the bacteria on an object, this may be to test:
 - **Disinfectant testing**
 - **The minimum inhibitory concentration of antibiotics**
 - **Food (such as an aerobic colony count)**
- Different methods are available to count bacteria:
 - **Total cell count**
 - It is quick but has several limitations:
 - **Does not distinguish living and dead cells**
 - **Small cells are hard to count**
 - **Precision is difficult to achieve**
 - **Not suitable for low density samples, <math> < 10^6 </math> cells per**
 - **Motile cells have to be immobilised**
 - An automated analyser can be used
 - **Viable cell count**
 - This is **sensitive and selective**
 - **Each cell can yield one colony**
 - **Spread plates or pour plates** can be used
 - However, the **bacteria must be able to survive 45°C molten agar**
 - **Serial dilutions are used for food testing**
 - **Doubling dilutions for disinfectant testing**
 - **30-300 colonies per plate are counted**
 - **Total dry cell weight**
 - This can give an **estimate** depending on the weight of one bacteria
 - **Amount of cellular component**
 - Similar to the dry weight, **the amount of protein etc. available in the sample will give an indication to the number of cells**
 - **Bacterial inoculum size**
 - This is **important for antibiotic testing**
- Bacteria counting comes with many errors however:
 - **Suitability of the culture**
 - **Length of incubation**
 - **Pipetting errors**
 - **Human errors and cell clumping**