

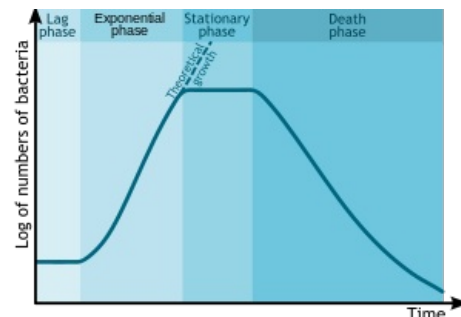
Measurement of bacterial growth

Growth of bacterial populations is caused by multiple binary divisions, which are repeated. Reproduction is subject to certain environmental influences and its course can be demonstrated on the growth curve.

Growth curve

We can distinguish 4 phases:

1. **Resting phase** (lag phase) - bacteria adapt to the new environment, the number of cells does not increase. Cells that have not adapted to the new environment die. The cell volume and weight increase. Sensitivity to physical and chemical influences is growing. The amount of enzymes increases, the components necessary for separation are synthesized.
2. **Accelerated growth** - cells have adapted, they are starting to divide, growth rate is increasing, generation time is shortening.
3. **Exponential phase** (log phase / logarithmic phase) - is the most important, bacteria multiply intensively, growth rate is fastest and generation time is shortest and population grows exponentially, This phase lasts until nutrient depletion. Cells have a constant size, and the products of metabolism increase. Growth rate is affected by the content of limiting nutrients.
4. **Slow growth phase** - growth rate slows down, the number of dying cells increases, nutrients are depleted.
5. **Stationary phase** - the rate of cell proliferation slows down, a state of equilibrium is created, when the number of cells does not change roughly, metabolites accumulate and the nutrient medium is depleted.
6. **Dying phase** - the number of dead cells is greater than the number of newly formed ones, resting stages may occur. The total number of cells may decrease (autolysis / self-digestion)



Procedure

1. Using an automatic pipette, take 0.1 ml of the broth containing bacteria, inoculate on End soil and spread evenly with a burnt loop.
2. We repeat this procedure five times, each time in twenty minutes - this time interval is chosen because the approximate generation time of *E. coli* is twenty minutes.
3. Let it incubate overnight, then count the grown colonies in each petri dish and compile a growth curve.

References

Related articles

- E-test
- Minimální inhibiční koncentrace
- Minimální baktericidní koncentrace