

Microbial Growth

Chapter 6

Student required vocabulary

inoculum
culture
sterile

Lecture outline

- I. Growth Requirements
 - A. Physical Requirements
 1. temperature
 - 1) optimum growth temperature
 - a. psychrophils
 - b. psychrotrophs
 - c. mesophiles
 - d. thermophiles
 - e. hyperthermophiles
 2. pH
 - a. neutrophiles
 - b. acidophiles
 - c. alkalophiles
 3. osmotic pressure
 - 1) plasmolysis
 - 2)
 - a. osmotolerant
 - b. halophiles
 - c. extreme halophiles
 - d. facultative halophiles
 - B. Chemical Requirements
 1. major elements
 2. trace elements
 3. oxygen
 - a. obligate aerobes
 - b. obligate anaerobes
 - c. facultative anaerobes
 - d. microaerophiles
 - e. aerotolerant anaerobes
- II. Biofilms
 - A. Quorum sensing
 - B. Advantages
- III. Culture Media
 - A. Chemically defined
 - B. Complex
 - C. Special
 - D. Selective & Differential
 - E. Enrichment
 - F. Storage

IV. Growth

A. Bacterial division

1. binary fission
 - a. logarithmic
2. microbial growth

B. Generation time

C. Phases of growth

1. closed system
 - a. growth curve
 - 1) lag phase
 - 2) log phase
 - 3) stationary phase
 - 4) death phase
 - b. colony growth
2. continuous culture

D. Measurement

1. direct
 - a. plate counts
 - 1) colony forming units
 - b. pour and spread plate
 - c. filtration
 - d. most probable number
 - e. direct count
2. indirect
 - a. turbidity
 - b. metabolic activity
 - c. dry wt.