



## Chapter 41 – Applied and Industrial Microbiology

- Overview This chapter summarizes how we have taken advantage of (domesticated?) microorganisms and used them to produce non-food items for our benefit. It is also an introduction to the microbiology of water and sewage.
- Introduction *Read.* Define: Industrial microbiology.
- 41.1 Water Purification and Sanitary Analysis
- Introduction *Read carefully*, including Fig 41.1 and Box 41.1, and understand the process.
  - Sanitary Analysis *Review* for major concepts.
- 41.2 Wastewater Treatment
- Introduction *Read*
  - Water Quality *Read. Define:* BOD.
  - Wastewater *Read carefully*, including Fig 41.4 and Tab 41.4 and understand the process.  
*Read* Fig 41.6 and Tab 41.5.
  - Home Treatment *Read* and *Review* Figs 41.7 & 41.8.
- 41.3 Microorganisms Used in Industrial Microbiology
- Introduction *Read.*
  - MO's in Nature *Review*, including Box 41.2 and Tab 41.6.
  - Manipulation *Review* for perspective. *Review* Fig 41.10 and Tab 41.7 for applications.
  - Preservation *Review.*
- 41.4 Microorganism Growth in Controlled Environments
- Introduction *Review. Define:* Fermentation. *Read* Tab 41.11.
  - Development *Review*, including Tab 41.12.
  - Growth *Read*, including Fig 41.13. *Define:* Primary and secondary metabolites, Fig 41.15.
- 41.5 Major Products of Industrial Microbiology
- Introduction *Read. Review* Tab 41.13.
  - Antibiotics *Review*, including Fig 41.16.
  - Amino Acids *Review*, including Fig 41.18.
  - Organic Acids *Review*, including Tab 41.14.
  - Specialty *Review*, including Tab 41.15.
  - Biopolymers *Review.*
  - Biosurfactants *Review.*
  - Bioconversion *Review.*
- 41.6 Biodegradation and Bioremediation by Natural Communities
- Introduction *Review.*
  - Biodegradation *Review*, including Figs 41.21 & 41.22 and Box 41.3.
  - Stimulating *Review*, including Fig 41.23, 41.25 & 41.26.
- 41.7 Bioaugmentation
- Introduction *Review.*
  - Impact *Review.*
- 41.8 Microbes as Products
- Introduction *Review.*
  - Nanotechnology *Review.*
  - Biosensors *Review.*
  - Biopesticides *Read*, including Fig 41.30.
- 41.9 Impacts of Microbial Biotechnology  
*Read.*