

Session 9 - Applied Microbiology

Text:	Chapters 41 and 42
Anticipated time:	2-3 class periods
Review Questions:	Chap 41: 1, 4, 5, 7, 9, 10 42: 2, 7, 11, 12, 13, 14
Thinking Questions:	Chap 41: 1 42: 3, 4
Basic Objectives:	You should be able to discuss how microorganisms have been used to benefit mankind. We have taken advantage of the growth of microorganisms and used their growth characteristics to produce many beneficial products.

Chapter 41 - Microbiology of Food

Overview	This chapter summarizes the relationship of microorganisms to food-our food. Remember, mo's are decomposers. We do not have time to cover everything in this chapter, but there is a wealth of practical information here. Read and enjoy.
Introduction	Read.
41.1 Microorganism Growth in Foods	
Introduction	<i>Read</i> , and <i>Review</i> Fig 41.1 and Tab 41.1.
Intrinsic Factors	<i>Read</i> .
Extrinsic Factors	<i>Read</i> .
41.2 Microbial Growth and Food Spoilage	
	<i>Read carefully. Read</i> Tab 41.3 for fun. What are aflatoxins?
41.3 Controlling Food Spoilage	
	<i>Review</i> this entire section, including Tabs 41.4 & 41.5. There is little here we have not already covered.
41.4 Food-Borne Diseases	
Introduction	<i>Read carefully</i> .
Infection...	<i>Read carefully.</i> Read Tab 41.6. Read Boxs 41.1 & 41.2. Do you support Country of Origin Labeling of your food?
Intoxication...	<i>Read carefully.</i> Differentiate: Intoxication from Infection.
41.5 Detection of Food-Borne Pathogens	
	<i>Read</i> for perspective.
41.6 Microbiology of Fermented Foods	
Introduction	<i>Read</i> .
Fermented Milks	<i>Review</i> , including Tab 41.7.
Cheese Production	<i>Review</i> , including Tab 41.8.
Meat and Fish	<i>Review</i> .
Alcoholic...	<i>Review</i> .
Breads	<i>Review</i> .
Other Foods	<i>Review</i> , including Tab 41.9.
41.7 Microorganisms as Foods and Food Amendments	
	<i>Read carefully</i> .

Chapter 42 - Industrial Microbiology and Biotechnology

- Overview This chapter summarizes how we have taken advantage of (domesticated?) microorganisms and used them to produce non-food items for our benefit.
- Introduction *Read.* Define: Industrial microbiology.
- 42.1 Choosing Microorganisms for Industrial Microbiology and Biotechnology
- Introduction *Read.*
 - Finding Micro... *Review*, including Box 42.1 and Tabs 42.1 and 42.2.
 - Genetic Manip... *Review* for perspective. *Review* Fig 42.1 and 42.2 for significance. *Review* Tab 42.3 for applications.
 - Preservation of... *Review.*
- 42.2 Microorganism Growth in Controlled Environments
- Introduction *Review.* Define: Fermentation. *Read* Tab 42.7.
 - Medium Develop... *Review*, including Tab 42.8.
 - Growth of... *Read.* *Review* Figs 42.5, 42.7 & 42.8. Define: Primary and secondary metabolites.
- 42.3 Major Products of Industrial Microbiology
- Introduction *Read.* *Review* Tab 42.9.
 - Antibiotics *Review.*
 - Amino Acids *Review*, including Fig 42.10.
 - Organic Acids *Review*, including Tab 42.10.
 - Specialty... *Review*, including Tab 42.11.
 - Biopolymers *Review.*
 - Biosurfactants *Review.*
 - Bioconversion... *Review.*
- 42.4 Microbial Growth in Complex Environments
- Introduction *Review.*
 - Biodegradation... *Review*, including Fig 42.13, and Box 42.2.
 - Changing... *Review*, including Figs 42.17 & 42.18.
 - Addition of... *Review.*
- 42.5 Biotechnological Applications
- Introduction *Review.*
 - Biosensors *Review*, including Tab 42.13 and Techniques Box 42.4.
 - Microarrays *Review*, including Fig 42.21
 - Biopesticides *Review*, including Tab 42.14 and Fig 42.22.
- 42.6 Impacts of Microbial Biotechnology
- Review.*