

PHR 250

Foodborne Infections and Intoxications

Meets M & W, 6 to 8 p.m., Room 203 Surge IV

D. O. Cliver and M. N. Hajmeer

This 4-unit elective course is intended for those who have had a first course in Food Microbiology (e.g., FST 104) or in Food Safety (e.g., VMD 413). Those who do not satisfy this should at least have had a first course in microbiology and be prepared to do additional reading. This second course offers a deeper understanding of the agents of foodborne disease, addresses the sources and fate of these agents as they may occur in foods, and then undertakes to apply this information in epidemiologic problem-solving. Possibilities for pre-harvest control will be considered for each agent, after which an overview will be presented. Guest instructors will be used to take advantage of special capabilities of the faculty.

Introduction

4/3 (A)	6	Classification of foodborne pathogens; sources of contamination	Cliver
	7	Incidence of foodborne diseases	Cliver

Infectious agents

4/5 (B)	6	Bacteria: <i>Salmonella</i> spp	Hajmeer
	7	Bacteria: <i>Campylobacter</i> , <i>Helicobacter</i> , <i>Arcobacter</i>	Cliver
4/10 (C)	6	Bacteria: <i>Shigella</i> spp., <i>Yersinia enterocolitica</i>	Cliver
	7	Bacteria: <i>Clostridium perfringens</i>	Hajmeer
4/12 (D)	6	Bacteria: <i>Vibrio</i> spp.	Cliver
	7	Bacteria: <i>Listeria monocytogenes</i>	Hajmeer
4/17 (E)	6	Bacteria: <i>Escherichia coli</i>	Cliver
	7	Bacteria: Other	Hajmeer
4/19 (F)	6	Viruses & prions	Cliver
	7	Parasites	Cliver
4/24 (G)	6	Protozoa	Cliver

Toxigenic agents

(G)	7	Seafood toxins, etc.	Cliver
4/26 (H)	6	Bacteria: <i>Bacillus cereus</i>	Hajmeer
	7	First midterm (Infectious agents; 30% of grade)	
5/1 (I)	6	Bacteria: <i>Clostridium botulinum</i>	Hajmeer
	7	Bacteria: <i>Staphylococcus aureus</i>	Hajmeer
5/3 (J)	6,7	Fungi and mycotoxins	Mount
5/8 (K)	6	Poisonous plants and animals, residues	Mount

Food sanitation and preservation

(K)	7	Food preservation	Cliver
5/10 (L)	6	Microbiological testing of foods	Hajmeer, Cliver
	7	GMPs, SSOPs, SOPs, and HACCP	Hajmeer
5/15(M)	6	Antimicrobial interventions	Hajmeer
	7	Predictive modeling	Hajmeer
5/17 (N)	6,7	Microbial ecology of foods	Cliver

Foodborne disease outbreaks

5/22 (O)	6	Outbreak investigation methods	Hajmeer
	7	Second midterm (Toxigenic agents, sanitation, preservation; 30% of grade)	
5/24 (P)	6,7	Outbreak investigation problems	Cliver, Hajmeer
		(5/29 Memorial Day)	
5/31 (Q)	6,7	Outbreak investigation problems	Cliver, Hajmeer
6/5 (R)	6,7	Outbreak investigation problems	Cliver, Hajmeer
6/7 (S)	6,7	Outbreak investigation problems	Cliver, Hajmeer

Final exam—problem-solving take-home (open-book, **individual effort**; 40% of grade)

Required text: IAFP 1999. Procedures to Investigate Foodborne Illness, 5th ed.

Faculty:

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Course web site:

<<http://www.vetmed.ucdavis.edu/PHR/PHR150/PHR150.htm>>

Suggested readings:

- AIFST (NSW Branch), Food Microbiology Group. 1997. Foodborne Microorganisms of Public Health Significance. Australian Institute of Food Science and Technology Inc., North Sydney, NSW 2059.
- Bryan, F.L. 1989. Diseases Transmitted by Food, Centers for Disease Control.
- CAST. 1994. Foodborne Pathogens: Risks and Consequences., Task Force Rept. No. 122. Council for Agricultural Science and Technology, Ames, IA.
- Chin, J. D. (ed) 2000. Control of Communicable Diseases Manual, 17th ed., American Public Health Association, Washington, DC.
- Cliver, D.O., and H. P. Riemann (Eds) 2002. Foodborne Diseases, 2d ed., Academic Press. **[on reserve]**
- Doyle, M.P. (Ed) 1989. Foodborne Bacterial Pathogens, Marcel Dekker.
- Doyle, M. P., L. R. Beuchat, and T. J. Montville (eds.) 2001. Food Microbiology: Fundamentals and Frontiers, 2d ed., American Society for Microbiology.
- International Commission on Microbiological Specifications for Foods. 1996. Microorganisms in Foods. 5. Characteristics of Microbial Pathogens, Blackie.
- Riemann, H. P., and D. O. Cliver, eds. 2006. Foodborne Infections and Intoxications, 3d ed. Academic Press (Elsevier), London, Amsterdam.
- Tollefson, L. (ed.) 1998. Veterinary Clinics of North America: Food Animal Practice—Microbial Food Borne Pathogens, W. B. Saunders.

About grades:

The midterm on 4/26 will cover the infectious agents, for 30% of the final grade. The second midterm, on 5/22, will cover the remaining material before the start of outbreak investigations and will count for another 30% of the final grade. Midterms will comprise objective and short-answer type questions that are intended to emphasize principles, rather than picky details (see last year's at course web site). For example, you are unlikely to be asked optimum growth temperatures of specific bacteria, but you need to remember which are gram-positive and which gram-negative.

The take-home final will entail investigation of model foodborne disease outbreaks. Although it will not be cumulative in the usual sense, you will be expected to apply everything you have learned during the course to solving these problems. You may use any reference material you wish, but you may not consult with any other person, whether a class member or not.

Awarding grades at the end of a course is one of my least favorite things, but I have not found a way to avoid it. There will be no preconceived curve or numerical norms, and no requirement that some specific portion of the class get unfavorable grades. I am more concerned with rewarding excellence than with giving "gotchas."