

FOOD 523 – Advances in Food Microbiology (Term 1 2013)
The University of British Columbia

Overview and Syllabus

Weekly Lectures:

- Wednesday: 14:00 – 15:30, FNH Room 300
- Friday: 14:00 – 15:30, FNH Room 300

Instructor: Dr. Kevin Allen

Office Location: FNH Room 218

Availability:

- i. Tuesday 11 AM – 1 PM (Office hours)
- ii. I will be available for 30 minutes following each lecture
- iii. Electronically *via* Connect

Course over-view and format:

Advances in Food Microbiology is a topical course intended to provide an advanced understanding of issues faced in controlling pathogenic and spoilage microorganisms in the production, distribution, and consumption of food. The course utilizes traditional lecturing, student-centred learning, and topical discussions to cover course material and food safety issues occurring in the provincial, Canadian, and global food supply. Focus is placed on linking pathogens with relevant reservoirs and understanding basic mechanisms used by microorganisms to survive mitigation strategies. Students will be assessed by mid-term and final examinations, participation during lectures and seminars, and through their ability to direct a teaching seminar.

During the course, students will gain an advanced level of knowledge regarding the organisms identified as leading causes of foodborne disease in the developed world. This includes exploring unique genetic, physiological, toxin-related, epidemiological, etc., characteristics of various foodborne pathogens. Similarly, the manipulation of extrinsic and intrinsic parameters to control and/or enhance or minimise the presence of microorganisms in food will be discussed. Additional materials investigating antimicrobial resistance, pathogen detection, pathogen reservoirs, processing technology, and trends in foodborne disease that are relevant to foodborne disease are also investigated.

Learning outcomes:

- Develop an advanced understanding of microbiological issues associated with the food continuum;
- Develop a detailed understanding of the major microbiological reservoirs present in our food continuum, and how they may impact food quality and human disease;
- Develop an understanding of the physiological processes by which microorganisms use to survive food processing interventions;
- Develop familiarity with organisms identified as leading causes of foodborne disease;

- Develop familiarity with food regulatory agencies and regulations used to ensure food safety;
- Independently summarize peer-reviewed papers for oral presentation and discussion amongst the class using a seminar format;
- Improved oral communication through group and class-based discussion of topical food microbiology and food safety issues.

Student evaluation:

The course has been split between traditional lectures, student-directed learning, and topical discussions. Evaluation will be based on written examinations, presentations, and participation throughout the year. For written exams, the mid-term examination will be based on lectures (*i.e.* approximately lectures 1-9) while the final examination will consist of 3-5 essay-based questions in which students will have 48 h to complete. All students are expected to complete the test individually. Topics will be selected from class discussions, student-directed seminars and lecture materials, but may also include relevant topics not covered throughout the semester.

The number and style of student presentations will be based on student enrolment. It is expected that students will be responsible for providing one individual student-directed lecture, and possibly a second group-based presentation. Details regarding this will be provided by the end of the third week. In general, presentation evaluations will be equally divided between the following areas: comprehension and mastery of the chosen topic, ability to effectively communicate to peers, and the ability to stimulate discussion following the presentation. Please note that all presentations should make a clear attempt to engage the audience in a manner that stimulates discussion.

Monitoring topical food safety issues:

An important aspect of this course is to ensure students develop an understanding of how and why food safety issues occur in the food chain. To facilitate this, students will be expected to monitor recalls and outbreaks that occur in Canada and around the globe throughout the semester. Student-directed discussions regarding these topics, including how outbreaks occur and how they may be prevented, will be encouraged. Monitoring these issues may be done through relevant electronic formats, with communication to the class expected. Student participation in these discussions will contribute to your participation mark.

- Mid-term examination: 35%
- Student seminar(s) 20%
- Final Examination: 35%
- Participation: 10%

Academic Conduct:

At all times, students are expected to behave in an appropriate and respectful manner. All students should review the UBC policy on academic honesty (www.students.ubc.ca/calendar/index.cfm?tree=3,286,0,0) and plagiarism

<http://www.library.ubc.ca/home/plagiarism/>). If you are unsure of appropriate behaviour, please consult the instructor.

Food Microbiological References/Resources:

Journals:

Applied and Environmental Microbiology; Comprehensive Reviews in Food Science and Food Safety; International Journal of Food Microbiology; Food Control; Food Microbiology; Journal of Applied Microbiology; Journal of Food Protection; Journal of Food Science

Books (Note: can be accessed online from the UBC Library website):

Motarjemi , Yasmine; Adams, Martin. Emerging Foodborne Pathogens. Woodhead Publishing.

*Jay, James M.; Loessner, Martin J.; Golden, David A. Modern Food Microbiology. 7th edition, Springer 2005 (Note: an electronic version of this book is available freely online).

Lund, B. M.; Baird-Parker, T. C.; Gould, G. W. Microbiological Safety and Quality of Food, Volumes 1-2. Springer - Verlag.

Blackburn, C.W.; McClure, P.J. (2002). Foodborne Pathogens - Hazards, Risk Analysis and Control. Woodhead Publishing.

Tentative Lecture Schedule – Fall 2012

Lecture	Date	Topic
1	Sept 4	Course introduction and overview; Daily barf registration; associated reading; assignments
2	Sept 6	Review of Food Microbiology basics
3	Sept 11	Food microbiology/safety history, disease, trends and emerging pathogens
4	Sept 13	Foodborne pathogen reservoirs, pre/post-harvest control, and microbiological quality of food Food safety discussion
5	Sept 18	Microbial survival in the food chain Food safety discussion
6	Sept 20	Produce as a source of foodborne disease Dr. Pascal Delaquis, Agriculture and Agri-food Canada
7	Sept 25	New and emerging technologies for the reduction of pathogenic and spoilage organisms in food Food safety discussion
8	Sep 27	Microbial survival in the food chain Food safety discussion
9	Oct 2	Epidemiology of foodborne disease Marsha Taylor, BC Centre for Disease Control
10	Oct 4	Food production plant sanitation, hygiene practices and the role of genotyping Food safety discussion
11	Oct 9	Antimicrobial resistance in the food supply Brandon Young, MSc Student
12	Oct 11	<i>Listeria</i> policy in food Jovana Kovacevic, PhD Student
13	Oct 16	VTEC Dr. Susan Bach, Agriculture and Agri-Food Canada

14	Oct 18	Student presentation Food safety discussion
15	Oct 23	Mid-term Examination
16	Oct 25	Student presentation Food safety discussion
17	Oct 30	Student presentation Food safety discussion
18	Nov 1	TBD
19	Nov 6	Student presentation Food safety discussion
20	Nov 8	Student presentation Food safety discussion
21	Nov 13	Student presentation Food safety discussion
22	Nov 15	Student presentation Food safety discussion
23	Nov 20	Student presentation Food safety discussion
24	Nov 22	Student presentation Food safety discussion
25	Nov 27	Review Lecture
26	Nov 29	Review Lecture