University of Guelph
Department of Population Medicine
POPM*4040 Epidemiology of Foodborne Diseases F (3-0) [0.50]
Fall 2017

Instructor:
Dr. Scott McEwen
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Course Coordinator:
Dr. Scott McEwen

Teaching Assistant:
Alyssa Green
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Course Prerequisites:
At least one of FOOD*3230 (Food Microbiology) OR POPM*3240 (Epidemiology), OR permission of instructor.

Lectures:
Tuesday and Thursday mornings, 8:30-9:50 am, Animal Science & Nutrition (ANNU) 156

Calendar Description:
This course examines the epidemiology and prevention of food-borne infections and intoxications, including those of both microbiological and chemical origin. Drawing on outbreak investigations, surveys, risk assessments, government surveillance systems and basic research, the biological, ecological, socio-economic and public health context of these diseases will be discussed.

Teaching Strategy:
The course will be primarily lecture based, with encouragement of discussion. Where possible, guest lecturers who are experts in a given topic area will deliver lectures. The focus will be on the skills necessary to investigate and evaluate the epidemiological patterns of foodborne diseases, including the assessment of the magnitude of foodborne disease problems, outbreak investigation, risk assessment, and communication. The emphasis will be on extracting generalizable principles and methodologies for understanding and controlling foodborne diseases.

Course Learning Outcomes:
At the end of the course, successful students will be able to:

1. Describe the basic epidemiology of foodborne infections and intoxications that are currently of major interest and importance.

2. Apply epidemiological concepts to the study of the etiology, impact and control of foodborne diseases, including their ecological and socio-economic contexts.

3. Analyse and interpret basic epidemiologic data from foodborne outbreaks.

4. Integrate science with socio-political understanding to make informed arguments about the management of risks and uncertainty related to foodborne diseases.

5. Communicate the nature of risks associated with foodborne diseases to both the general public and specific vulnerable populations.

Evaluation and Grading:

Grade item	**Due Date**	**Weight (%)**
Food Diary and Reflection	September 28	20
Midterm exam (take-home)	October 17	20
Public Dissemination	November 16	20
Town Hall Meetings	November 28 and 30	15
Final Exam	December 7 19:00-21:00	25

Where possible, assignments should be submitted in electronic form to the Courselink Dropbox, otherwise hard copies maybe handed in during class. They are due **by 11:59 pm** on the posted date.

Late Assignments:
One mark (1% of course) will be deducted for each day that the assignment is submitted late.

Referencing:
When submitting to a journal you must use their referencing style. **For the Food Diary & Reflection and Public Dissemination,** use the referencing style of either the **Canadian Journal of Public Health** or **Foodborne Pathogens and Disease** journal. You can find referencing instructions on the journal websites (http://journal.cpha.ca/index.php/cjph/about/submissions; http://www.liebertpub.com/manuscript/foodborne-pathogens-and-disease/108/). You only need to follow the instructions for referencing and in-text citations.

When selecting references for assignments, general websites (e.g. Wikipedia) are not

appropriate sources. **If you want to use lecture notes, find and reference the original source of the information, not the lecture notes.** The U of G library and Library website are extremely valuable resources for learning how to do a proper literature search and organizing your references (http://www.lib.uoguelph.ca/get-assistance/writing/citations; http://www.lib.uoguelph.ca/get-assistance/research-help).

Assignments and Exams:

1. **Food diary and reflection (marked out of 20) - Due Sept. 28, 2017**

For the **Food diary (marked out of 5)**, you will be asked to keep a detailed record of everything you ate everyday for 5 days. For each meal and day write down (in a chart format):

- What you ate (food types)
- Where it came from (country/region). **Note:** This does not mean "Zehrs"! or where the manufacturer's head office is located. This may require reading labels, reading price cards on fruits/veggies, asking the store owners about meat or vegetables, calling manufacturers, etc. if foods are not labeled as to origin,
- Method of preparation (e.g. washed, peeled, marinated; used clean knife / cutting board / counter; boiled potatoes, baked ham, toasted bread, etc.)
- Where (and how) did you get your information? Who did you contact? What effort did you put into it?

You will then **reflect** briefly on the foodborne disease implications of that diet. **Warning:** this will require some critical thought!! This is a narrative that encompasses all the known facts. For instance, think about:

1. Where your food came from (Ontario? India? Mexico?) – what are the implications of this? As one example, consider that this will have an impact on how your food was handled en route to you, and therefore the risk posed…
2. The type of food you ate (chicken? tomatoes? sprouts? cheese?), and how you prepared it (raw chicken? fried tomatoes? raw sprouts? What about your cooking techniques, hygiene, how the food has been handled since in your possession, etc. etc.) – What risks are inherent in your diet as a result of your food choices and preparation methods?
3. Is there are larger narrative within which your personal story is unfolding? You might think, for instance, about the relationships between your habits, price, agricultural practices and foodborne diseases.

At the end of the narrative, summarize in bullet points the 3 major foodborne disease implications. For example, you may state:

- raw eggs in the Caesar salad could be a source of salmonellosis
- handling raw chicken without adequate hygiene may contaminate the kitchen with *Campylobacter jejuni*

- sprouts in the mixed green salad are a potential source of *E. coli*
-

Write this **reflection** as if you were writing an editorial/commentary **(marked out of 15)** for the Canadian Journal of Public Health (CJPH), complete with a few references, on the topic: **The Foodborne Disease Implications of My Daily Diet**. You can choose how you want to focus the editorial, but it should provide a comment (i.e. your opinion on a given topic), to spark interest or raise awareness in the readership and raise the profile of given topic.

- Maximum word length for the reflection: 1,200 words (double-spaced), not including references (include the word count on the title page)
- Commentaries take a "position" and then bring forth arguments or evidence to support that position.
- Attention must be paid to format, grammar, and writing style (do not use contractions!). You can write in the first person, but do not use colloquial language.

You can look at previous issues of the CJPH for examples (available online through the library). The food diary and reflection are due **by 11:59 pm Sept. 28, 2017**, submitted in electronic form to the Courselink dropbox.

2. Midterm exam (marked out of 20) - Due October 17th, 2017.

The **midterm exam** is a take-home exam and **consists of an outbreak investigation.** You will be given a set of data on **Oct. 12th in class**, showing who ate what, who got sick, etc., and be expected to answer a set of questions based on your analyses. As this is the midterm examination, this is to be done as individuals without consulting others. If you are unable to attend class the day the midterm in handed out, please make arrangements to get the midterm from the TA (Stephanie Hughes). **Due October 17th, 2017**. You may submit the assignment in electronic form to the Courselink dropbox (by 11:59pm), or in hard copy during class.

3. Public dissemination (marked out of 20) - Due November 16th, 2017

This assignment consists of two components: a) public dissemination project, and b) justification / explanation of the dissemination.

3.1. Public dissemination project (10 marks)

You will be asked to select a **target group**, a **message** you think that group needs to be made aware of, and design an appropriate **communication** to get the message across. Communication methods may include poster, workshop, web-page, video (animation, game, and songs), comic story, demonstration-education dinner or other. If your method of communication involves a workshop, talk, seminar, video, or even the presentation of a meal you have prepared, we can

give you the opportunity to present it to the class. You are not required to present your project in class, this is optional.

Please select from the following target groups:

- Pregnant women
- College students learning how to cook
- Adventure travelers
- Members of a particular ethnic or religious group (eg Jewish, Muslim, Old Order Mennonite, Hindu, Italian, Chinese, Korean)
- Day care centres
- Seniors' residences
- TV gourmet chefs
- Check-out clerks at a grocery store
- Farmers
- Farmers' Markets vendors

If you have another group in mind, clear it with Scott in advance.

You may do this in groups of up to 3 people, if the project is more complex than a simple poster or brochure and is **approved by Scott ahead of time**. Only one project per group is required to be handed in. Note that everyone in the group gets the same mark except that **2 out of 10 marks** will be based on peer evaluation (i.e.an assessment of each group member's participation and contribution to the group effort by the other members of the group). More than one person or group can select the same target group.

3.2. Dissemination justification (10 marks)

The dissemination justification must include:

- Justification: In 2-3 pages (double-spaced), with references (in the style of the **Canadian Journal of Public Health** or **Foodborne Pathogens and Disease**)
- Clearly identify: **WHO** your target group is, **WHAT** message you want to get across to them, **WHY** they need to hear this message (use a few references to back this up), and **WHY** you chose the particular form of communication that you did. Be sure the form of communication and the language you use is appropriate to your particular target group! (the average layperson probably does not know what a "zoonosis" or "enterocyte" is, for example)
- Be creative; try to think beyond the typical pamphlet/brochure.

Due November 16th, 2017. You may submit the assignment in electronic form to the Courselink dropbox (by 11:59pm), or in hard copy during class.

4. Town Hall Meetings (marked out of 15) – held in class November 28th & 30th, 2017

There will be two Town Hall meetings. We will divide the class into representatives from different stakeholder groups (e.g. industry, farmers/workers, consumer/advocacy groups,

media, the government and local city residents etc.). You will be given a controversial topic and asked to defend a particular point of view, using the best science available at a simulated public meeting. This is a role playing game. You are encouraged to make this as realistic as possible – consider your vocabulary, appearance/dress, reactions to things being said in the meeting, etc. **What** are the special concerns of your group? **Which** issues are you concerned about and **why**? Maybe you do not have any concerns. Or maybe you have a lot. Make sure you consider both the **science** and the **economic** and **social** consequences to your advocacy group.

Note: Attendance is required for the Town Hall Meetings. That is, we do not want one group skipping out of Town Hall meetings because it is not their turn (we need a lively audience asking tough questions). Therefore, for your participation marks, you are required to hand in a **brief** comment on your position (i.e. one or two sentences) at the beginning of class. Similarly, at the end of class, you will be required to submit a brief exit statement as to how your position may or may not have changed as a result of the discussion. Therefore, **2 marks** (out of 15) are assigned simply for attending and providing your statements. The remaining 8 marks are for the presentation of your arguments. **These meetings will be done in class on November 28th & 30th, 2017.**

5. **Final Exam (marked out of 20):**

This will be a short answer/multiple choice exam covering the lecture materials during the course. The final exam will be held 19:00- 21:00 **December 7, 2017**. The room location will be assigned by the registrar closer to the date of the exam.

Grading (as per Undergraduate Degree Regulations and Procedures):
Please familiarize yourself with the grading procedures below:

80 - 100 (A) Excellent. An outstanding performance in which the student demonstrates a superior grasp of the subject matter, and an ability to go beyond the given material in a critical and constructive manner. The student demonstrates a high degree of creative and/or logical thinking, a superior ability to organize, to analyze, and to integrate ideas, and a thorough familiarity with the appropriate literature and techniques.

70 - 79 (B) Good. A more than adequate performance in which the student demonstrates a thorough grasp of the subject matter, and an ability to organize and examine the material in a critical and constructive manner. The student demonstrates a good understanding of the relevant issues and a familiarity with the appropriate literature and techniques.

60 - 69 (C) Acceptable. An adequate performance in which the student demonstrates a generally adequate grasp of the subject matter and a moderate ability to examine the material in a critical and constructive manner. The student displays an adequate understanding of the relevant issues, and a general familiarity with the appropriate literature and techniques.

50 - 59 (D) Minimally Acceptable. A barely adequate performance in which the student demonstrates a familiarity with the subject matter, but whose attempts to examine the material in a critical and constructive manner are only partially successful. The student displays some understanding of the relevant issues, and some familiarity with the appropriate literature and techniques.

0 - 49 (F) Fail. An inadequate performance.

In-Course Grade Re-evaluation: Please address any concerns regarding grading within **2 weeks** of receiving the graded assignment (no later than the final exam for the Public Dissemination, Project, and Town Hall Meeting grades). Please refer to the following steps for grade reassessments:

1- Review the grading procedures on the previous page to ensure that your work is deserving of a grade increase.

2- Within 2 weeks of receiving the graded assignment you can return the assignment to your Teaching Assistant (TA) with a **written explanation** of your concern outlining specifically where you believe an additional mark(s) is deserved.

3- Your TA will review your assignment and your written explanation and decide whether or not your assignment deserves the additional mark(s).

4- After having your assignment reviewed by your TA, if you are unsatisfied you can submit your assignment to the course coordinator (Scott McEwen) to be completely re-graded. **Note: Your assignment grade may go up, down, or remain the same.** For more information on grade reassessment please refer to the Undergraduate Calendar (https://www.uoguelph.ca/registrar/calendars/undergraduate/current/c08/c08-grdchg.shtml).

E-mail Communication

As per university regulations, all students are required to check their <mail.uoguelph.ca> e-mail account regularly: e-mail is the official route of communication between the University and its students.

When You Cannot Meet a Course Requirement

When you find yourself unable to meet an in-course requirement because of illness or compassionate reasons, please advise the course instructor (or designated person, such as a teaching assistant) in writing, with your name, id#, and e-mail contact. See the undergraduate calendar for information on regulations and procedures for Academic Consideration.

Drop Date

Courses that are one semester long must be dropped by the end of the fortieth class day; two-semester courses must be dropped by the last day of the add period in the second semester. The regulations and procedures for Dropping Courses are available in the Undergraduate Calendar.

Copies of out-of-class assignments

Keep paper and/or other reliable back-up copies of all out-of-class assignments: you may be asked to resubmit work at any time.

Accessibility

The University promotes the full participation of students who experience disabilities in their academic programs. To that end, the provision of academic accommodation is a shared responsibility between the University and the student.

When accommodations are needed, the student is required to first register with Student Accessibility Services (SAS). Documentation to substantiate the existence of a disability is required, however, interim accommodations may be possible while that process is underway. Accommodations are available for both permanent and temporary disabilities. It should be noted that common illnesses such as a cold or the flu do not constitute a disability.

Use of the SAS Exam Centre requires students to book their exams at least 7 days in advance, and not later than the 40th Class Day.

More information: www.uoguelph.ca/sas

Academic Misconduct

The University of Guelph is committed to upholding the highest standards of academic integrity and it is the responsibility of all members of the University community – faculty, staff, and students – to be aware of what constitutes academic misconduct and to do as much as possible to prevent academic offences from occurring. University of Guelph students have the responsibility of abiding by the University's policy on academic misconduct regardless of their location of study; faculty, staff and students have the responsibility of supporting an environment that discourages misconduct. Students need to remain aware that instructors have access to and the right to use electronic and other means of detection.

Please note: Whether or not a student intended to commit academic misconduct is not relevant for a finding of guilt. Hurried or careless submission of assignments does not excuse students from responsibility for verifying the academic integrity of their work before submitting it. Students who are in any doubt as to whether an action on their part could be construed as an academic offence should consult with a faculty member or faculty advisor.

The Academic Misconduct Policy is detailed in the Undergraduate Calendar.

Recording of Materials

Presentations which are made in relation to course work—including lectures—cannot be recorded or copied without the permission of the presenter, whether the instructor, a classmate or guest lecturer. Material recorded with permission is restricted to use for that course unless further permission is granted.

Resources

The Academic Calendars are the source of information about the University of Guelph's procedures, policies and regulations which apply to undergraduate, graduate and diploma programs.

Required Text

None

Recommended Texts & Readings:

- *Foodborne infections and intoxications*, 4rd edition, J. Glenn Morris, Jr. and Morris Potter, Elsevier Academic Press, 2013. (Available online through the Library).

- *Foodborne disease outbreaks: guidelines for investigation and control*, World Health Organization, 2008. Available at http://www.who.int/foodsafety/publications/foodborne_disease/outbreak_guidelines.pdf.

- *Procedures to Investigate Foodborne Illness*, 6th edition, published by the International Association for Food Protection, 2011.

- *Bad Bug Book, Foodborne Pathogenic Microorganisms and Natural Toxins*, 2nd edition, published by the U.S. Food and Drug Administration, 2012. Available at http://www.fda.gov/food/foodborneillnesscontaminants/causesofillnessbadbugbook/default.htm .

- *Foodborne Disease Handbook*, 2nd edition, edited by Y. Hui. New York: Marcel Dekker, Vol 1: Bacterial pathogens; Vol 2: Viruses, parasites, pathogens, and HACCP; Vol. 3: Plant Toxicants; Vol 4: Seafood and Environmental Toxins. 2000.

- *Food-borne viruses: progress and challenges (Emerging Issues in Food Safety),* Marion P. Koopmans, Dean O. Cliver, Albert Bosch. Washington, DC: ASM Press, 2008.

- *Principles & practice of public health surveillance,* 3rd ed, Lisa M. Lee, Stephen B. Thacker, Michael E. St. Louis, Steven M. Teutsch. Oxford; New York: Oxford University Press. 2010.

- *Methods in field epidemiology,* Pia D. M. MacDonald, Burlington, MA: Jones & Bartlett Learning; Washington,D.C. : APHA Press, 2012.

- *Control of Communicable Diseases Manual*, 19th edition, David Heymann, American Public Health Association, 2008.

- *Application of risk analysis to food standards issues, a Joint FAO/WHO Expert Consultation*. World Health Organization, Geneva, Switzerland, 13-17 March 1995. Available at: http://www.who.int/foodsafety/publications/risk-analysis/en/

Additional References:

- *Molecular epidemiology of infectious diseases: principles and practices*, Riley, Lee W. Washington, D.C.: ASM Press, 2004.

- *Microbiology of waterborne diseases,* Steven L Percival, Amsterdam; Boston: Elsevier Academic Press, 2004.

- *Cryptosporidium and cryptosporidiosis,* 2nd ed. Ronald Fayer and Lihua Xiao Boca Raton: CRC Press; London: IWA Pub. 2008.

- *Antimicrobial Resistance in the Environment,* Patricia L. Keen, Mark H. M. M. Montforts, Chicester: John Wiley & Sons, 2012.

- *Antimicrobial resistance in bacteria of animal origin,* Frank M. Aarestrup, Washington, D.C. : ASM Press, 2006.

- *Mycotoxin prevention and control in agriculture,* Michael Appell, David F. Kendra, Mary W. Trucksess, American Chemical Society. Division of Agricultural and Food Chemistry; American Chemical Society. Meeting 2008: New Orleans, La. Washington, DC: American Chemical Society; New York: Distributed by Oxford University Press, 2009.

- *Seafood and freshwater toxins: pharmacology, physiology, and detection*, 2nd ed. Luis M. Botana, Boca Raton: CRC Press, 2008.

- *HACCP*, Sara Mortimore and Carol Wallace, Malden, MA : Blackwell Science, 2001.

Journals:
There are several peer-reviewed journals that publish epidemiological studies on food and waterborne diseases. For instance, you will find peer-reviewed papers and reports in:

- Emerging Infectious Diseases
- Epidemiology and Infection
- Eurosurveillance
- Foodborne Pathogens and Disease
- Journal of Food Protection
- Morbidity and Mortality Weekly Report: MMWR
- Preventive Veterinary Medicine
- Zoonoses and Public Health

You can find Canadian information at the website for the Public Health Agency of Canada http://www.phac-aspc.gc.ca/zoono/index-eng.php. You can have access to FoodNet Canada (formerly C-EnterNet) surveillance publications and annual report at http://www.phac-aspc.gc.ca/foodnetcanada/index-eng.php. The National Enteric Surveillance Program (NESP) reports can be found at Public Health Agency of Canada website at https://www.nml-lnm.gc.ca/NESP-PNSME/index-eng.htm .
For the U.S., information about foodborne diseases can be found at the Centers for Disease Control and Prevention (CDC) home Page http://www.cdc.gov.

POPM*4040 Class Schedule 2017 (Instructors / topics are subject to change)

Date	Lecturer	Lectures and Due Dates
Sept. 7	Scott McEwen (SM)	An introduction to epidemiology of foodborne diseases
Sept. 12	SM	Basic epidemiology for foodborne diseases
Sept. 14	Wallis Rudnick	Outbreak investigation – how it is done in Canada **Begin food diary**
Sept. 19	SM	Basic epidemiology for foodborne diseases - 2
Sept. 21	SM	Foodborne disease surveillance and risk assessment
Sept. 26	SM	Disease burden – how big a problem is it?
Sept. 28	SM	*Listeria monocytogenes*, Vibrios **Food Diary and Reflection Due**
Oct. 3	Andrew Papadopoulos	Social and commercial marketing
Oct. 5	SM	Outbreak investigation – Case study
Oct. 12	SM	*Escherichia coli* **Take-Home Midterm Pick-Up in Class**
Oct. 17	SM	*Salmonella* **Take-Home Midterm Due**
Oct. 19	SM	*Campylobacter*
Oct. 24	Anne Deckert	Antimicrobial resistant bacteria in food
Oct. 26	SM	*Clostridium perfringens,* Staphylococcal food poisoning
Oct. 31	SM	Viral foodborne diseases **Topics for Town Hall Meetings distributed**
Nov. 2	SM	Waterborne disease
Nov. 7	SM	*Yersinia enterocolitica* and *Shigella*
Nov. 9	Andrew Peregrine	Foodborne parasites
Nov. 14	SM	Chemical intoxications, mycotoxicosis
Nov. 16	SM	Botulism, *Bacillus cereus*, Ciguatera, other marine biotoxins **Public dissemination Due**
Nov. 21	SM	EcoHealth approaches to foodborne and waterborne disease
Nov. 23	SM	Foodborne disease prevention and control **Possible public dissemination**
Nov. 28	SM	Town Hall Meeting
Nov. 30	SM	Town Hall Meeting
Dec. 7	19:00-21:00	**Final Exam**