

**Course Outline**  
**ANEQ676 Molecular Approaches to Food Safety**  
Fall 2017  
Lecture/Lab Tuesday 9:00-11:50 am  
Food Safety and Microbiology Laboratory, Animal Sciences

**Instructor:** Dr. Hua Yang (hua.yang@colostate.edu)  
Office hours: Fri 11.00-12.00 pm (Room 038, Animal Sciences)

**Teaching assistant:** Mo Jia (mojia@rams.colostate.edu)

**Description:** This is a research project-based course in which you will learn how to apply molecular approaches for foodborne pathogen detection, identification and characterization. We will apply our newly learned molecular techniques toward real samples collected from animal farms and use the generated data to answer real food safety questions.

**Schedule**

Aug	21		Class policies, safety and introduction
	28	Lab #1	Dairy Farm sample collection, enrichment and isolation of STEC and <i>Salmonella</i>
Sep	5	Lab #2	PCR detection of foodborne pathogens
	12	Lab #3	General Protein Techniques
	19	Lab #4	Detection of <i>Listeria</i> in ready to eat meat products (Dr. Alma Perez-Mendez, Leprino Foods)
	26	Lab #5	Visit of Leprino Foods (Dr. Alma Perez-Mendez, Leprino Foods)
Oct	3	Lab #6	Plasmid extraction
	10	Lab #7	Restriction Enzyme digestion and DNA Electrophoresis
	17	Lab #8	Gel purification and Ligation
	24	Lab #9	Exam 1, Electroporation
	31	Lab #10	Sequencing
Nov	7	Lab #11	Pulsed-Field Gel Electrophoresis (PFGE)
	14	Lab #12	PFGE (conc.)
	21		Fall break
	28	Lab #13	PFGE (conc.)
Dec	5		Exam 2

## **Learning Goals**

Students completing this class will have learned:

1. Skills and techniques associated with molecular methods commonly used in the food industry and food safety area;
2. How to design and conduct experiments and to analyze and interpret data;
3. How to apply molecular analysis to answer scientific questions and to solve food safety problems.

## **Grading**

- Attendance to all laboratory periods is required.
- Lab reports.
- Exams:
  - Exam 1: October 24
  - Exam 2: December 5
- Final paper.
- The Final Grade will be based on
  - Plan A: class participation (10%), lab reports (45%), exams (45%).
  - Plan B: class participation (10%), lab reports (35%), exams (35%) and final paper (20%).

**Traditional Grading:** 90-100%, A; 80-89%, B; 70-79%, C; 60-69%, D; Below 60%, F

**Reference Materials:** No Text Book. Handouts will be available for download from the website.

**Safety Precautions:** *Salmonella*, shiga toxin producing *E. coli*, and *Listeria* are generally categorized as Biosafety Level 2 pathogens. CMSQ *Safety Procedure Guidelines* should be followed for manipulating Biosafety Level 2 pathogens.

### **Colorado State University**

Department of Animal Sciences  
Center for Meat Safety & Quality

–*Microbiology and Chemistry Laboratory*–  
*Safety Procedure Guidelines and*  
*Orientation Protocol*