TEACHING GUIDE FOR THE COURSE
INTRODUCTION TO EPIDEMIOLOGY OF FOODBORNE PATHOGENS IN FOOD HYGIENE RESEARCH

AIM

After completing this course, the student will have the tools to perform an epidemiological study of foodborne pathogens in the food chain, from production animal farms to table.

TARGET STUDENTS

Originally, PhD students of the Department of Food Hygiene and Environmental Health or at the Doctoral Programme in Food Chain and Health. Now we are working on making this course open to anyone with interest in Foodborne diseases of animal origin and Veterinary epidemiology.

PREREQUISITE KNOWLEDGE

The course requires general knowledge in veterinary or animal science, microbiology, food production, farms, and basic knowledge of epidemiology and biostatics. However, there are no specific courses as prerequisites.

TOPICS TO BE ADDRESSED WITHIN THE COURSE

Basic veterinary epidemiology, design of studies, classical statistical analysis, Bayesian analysis, study of food and water outbreaks.

TIMETABLE WHEN THE COURSE WILL BE OFFERED

The first edition of the course was held from 9 am to 12:30 am, Monday May 27th to Friday May 31st in EE-building room B239 (Agnes Sjöbergin katu 2, Helsinki, 2nd floor). Now this course is open to anyone with internet access.

PROGRAM

Module 1. Introduction: Basic epidemiologic concepts

- Concepts (and definitions), uses and types
- Describing occurrence of foodborne pathogens
- Measures of frequency and measures of association

Module 2. Design of studies

- Population and samples: sampling and questionnaires
- Type of studies
- Bias: sampling error
  - Use of WinEpi (practicals)

Module 3. Statistical analysis (deterministic approach)

- Basic concepts: null hypothesis, p-values, interval of confidence, etc.
- Associations between variables
- Describing a distribution
- Central Limit Theorem
- Distributions: normal, binomial, Poisson
  - Use of SPSS (practicals)

Module 4. Bayesian analysis

- Probability
- Bayes' Theorem
- Stochastic process: Central limit theorem, binomial, Poisson, hypergeometric
  - Use of WinBugs and BetaBuster (practicals)

Module 5. Study of (food and water) outbreaks

- What are foodborne disease outbreaks?
- How is a foodborne disease outbreak investigated?
  - Practicals

REFERENCES

Bibliographic references and resources will be provided after each module.

INTENDED LEARNING OUTCOMES

Embedded intended learning outcomes

By the end of the course the student will be able to:

- Describe the epidemiologic concepts
- Differentiate between measures of association and frequency, and calculate them
- identify types of epidemiological studies
- Calculate and interpret a distribution, understand types of association between variables
- Define probability and differentiate between deterministic and stochastic process
- Detect and conduct an investigation of a foodborne outbreak

Generic intended learning outcomes embedded in the course

During the course the student will develop his/her competences in:

- Reasoning and critical thinking
- Teamwork, collaboration and communication
- Creativity

TEACHING / LEARNING ACTIVITIES (TLAS)

The TLAs include guided and independent learning, within small groups and collaborative learning. In order to create a better learning environment and create a good flow experience the course was structured by contact sessions. The topics of the contact sessions are the 5 modules.

Before the contact session, individually:

- Reading materials will be provided one week before the contact session.
- Small multiple-choice questionnaire (MCQ) as quick quizzes from the reading materials. To be submitted at latest the day before of the contact session.

At the contact session, at the lecture room:

- Short lecture updated with the results from the MCQ. 30 minutes to introduce/discuss the topic of the day.
- Time for the students to practice by themselves, individually. 20 minutes. The students will have to:

- General discussion, to summarize what was learnt during the day. 30 minutes. The teacher guides the discussion. If time, it includes a minute paper (individually). The students will write as bullet-points a minute paper:

Use of educational new technologies

- Distribution of reading materials -> e.g. Moodle
- On-line tool for the multiple-choice questionnaire (MCQ) as quick quizzes -> e.g. Moodle or Presemo
- Own practice during the course-day -> professional/specific software. If computer room is not available, they would be advice to bring their own laptop.
- Minute paper -> e.g. Moodle, in case time runs out during the contact session.

ASSESSMENT TASK (ATS)

The idea is to design assessment tasks that link theory and practice in order to replicate authentic learning environments by integrating knowledge, skills and personal qualities.

Before the contact session, individually:

- Multiple-choice questionnaire as quizzes -> with the objective of diagnosing and activating the knowledge of the students, and to identify weaknesses in prior knowledge or skills to provide timely feedback, and then to provide productive pathways to future learning

At the contact session, at the lecture room, in groups

- Minute paper -> learning activity and collection of feedback (formative feedback) from students. It would also serve as a review for the next class. In case time runs out during the contact session, it will be possible to submit the minute paper via Moodle the same day.

After the last contact session:

- Final written essay assignment, individually.

The goal of this assignment is to practice planning and designing an epidemiological study to guarantee the food safety from food production animal farms to table, thus, the student will be able to link the current knowledge to situations in real-life professional contexts. The student should be able to construct his/her response, display originality and ability to make a case or argument. He/she will gather together the ideas/knowledge acquired during the contact sessions for planning a study to be implemented in an imaginary farm.

Rubrics for final essay assignment will be provided

Grading

Assignment	Group or individual	Deadline for submission	Grading scale	Percentage of final grade
Multiple-choice questionnaires	individual	day before the contact session	incomplete/complete	10 %
Minute paper	groups	during the day of the contact session	incomplete/complete	20 %
Essay assignment	individual	one week after the last contact session	0-12	70 %