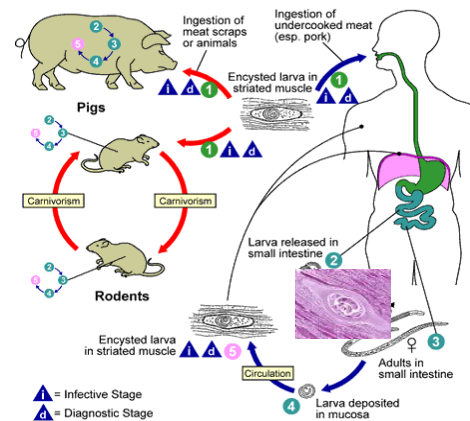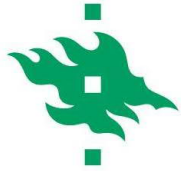# Introduction to Epidemiology of Foodborne Pathogens in Food Hygiene Research

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At the end of the course, the student should 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

1. Basic epidemiologic concepts
- Definitions, uses and types
- Describing occurrence of foodborne pathogens
- Measures of frequency and measures of association

➢ WinEpi

2. Design of studies
- Population and samples: sampling and questionnaires
- Type of studies
- Bias: sampling error

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

➢ SPSS

4. Bayesian analysis
- Probability
- Bayes' Theorem
- Stochastic process: Central limit theorem, binomial, Poisson, hypergeometric

➢ WinBugs and BetaBuster

5. Study of (food and water) outbreaks
- What are foodborne disease outbreaks?
- How is a foodborne disease outbreak investigated?

Functions

Design of studies: sampling and questionnaires

Study of outbreaks

Risk factors

Risk Analysis

Surveillance and monitoring

Economic studies

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Methodology

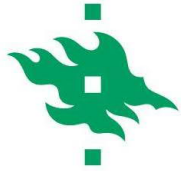Statistical analysis: Bayesian and frequentist

Spatio-temporal studies

Mathematical modelling

Risk analysis: quantitative and qualitative

Molecular epidemiology

Network and cluster analysis

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References

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Pfeiffer, D.U. Veterinary Epidemiology – An introduction. Royal Veterinary College, Univ. London, 2002.

Thrusfield, M.V. Veterinary Epidemiology. 3rd ed. Oxford, United Kingdom: Blackwell Science, 2007.