

Quantitative Veterinary Epidemiology

MAS Thesis track choice 2022

Bart van den Borne (QVE, BEC)



Program

- General introduction to QVE (30min)
 - Who we are
 - Research
 - Education
- Q&A (15min)

Introduction QVE

Who are we?

- Prof. dr. Mart de Jong
 - Prof. dr. Ynte Schukken
 - Prof. dr. Wim van der Poel
 - Dr. Gustavo Monti
 - Dr. Quirine ten Bosch
 - Dr. Bart van den Borne
 - Dr. Nienke Hartemink
- + 1 postdoc and 22 PhD students



What is (infectious) disease epidemiology?

- The study of the population dynamics of infectious diseases and how to manage them
 - Aim: to prevent and control diseases
 - Animal health
 - Economy
 - Human health
 - Animal welfare
 - Environmental health (GHG emissions)
 - Satisfaction of animal owner

What do we do?

- Generate and disseminate knowledge on the epidemiology of infectious diseases in (production) animals (and humans)
 - Transmission of infectious diseases within and between groups of animals (incl. humans)
 - Factors influencing that transmission
 - Effect of interventions



How do we do that?

- Statistically investigate occurrence, causes and distribution of diseases in populations
- Quantifying risk factors for disease, infection, or transmission, to identify preventive measures
- Modelling dynamics of infections
- Transmission experiments

Some examples

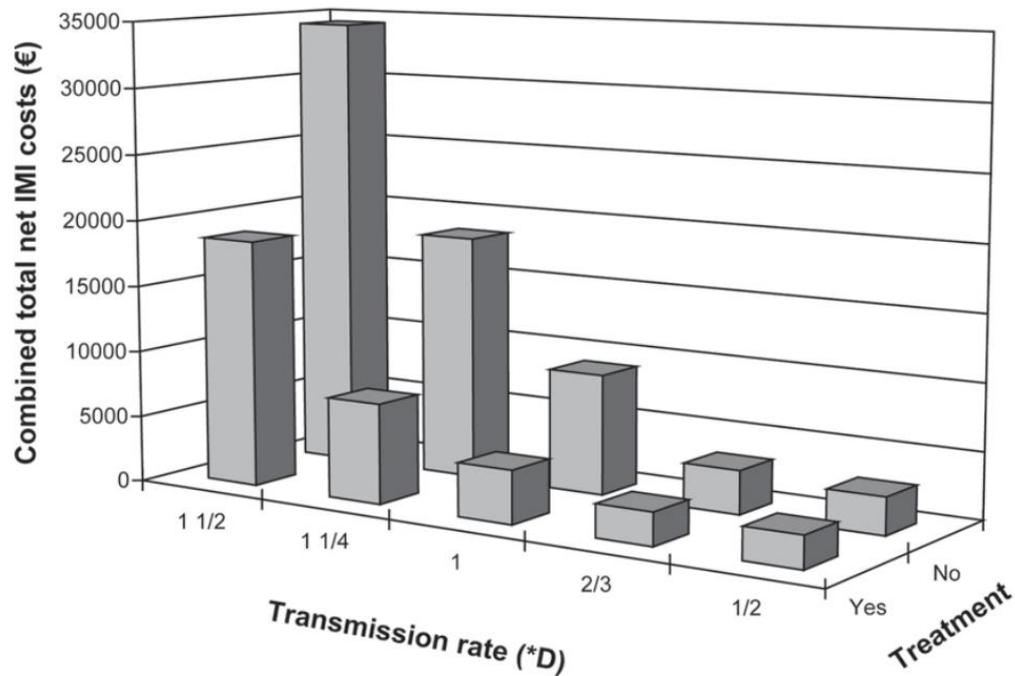
Bovine Tuberculosis in Ireland

- Badgers reservoir for bTB (=zoonosis)
- Culling is unethical + illegal
- Vaccination trial in badgers
- Reduction in badger-to-badger transmission
- Modelling: vaccination of badgers can eradicate bTB in the current cattle-badger system



Mastitis in dairy cows

- Treatment of subclinical mastitis → cure of *S. aureus*
 - 1st high SCC: 65%
 - 2nd high SCC: 43%

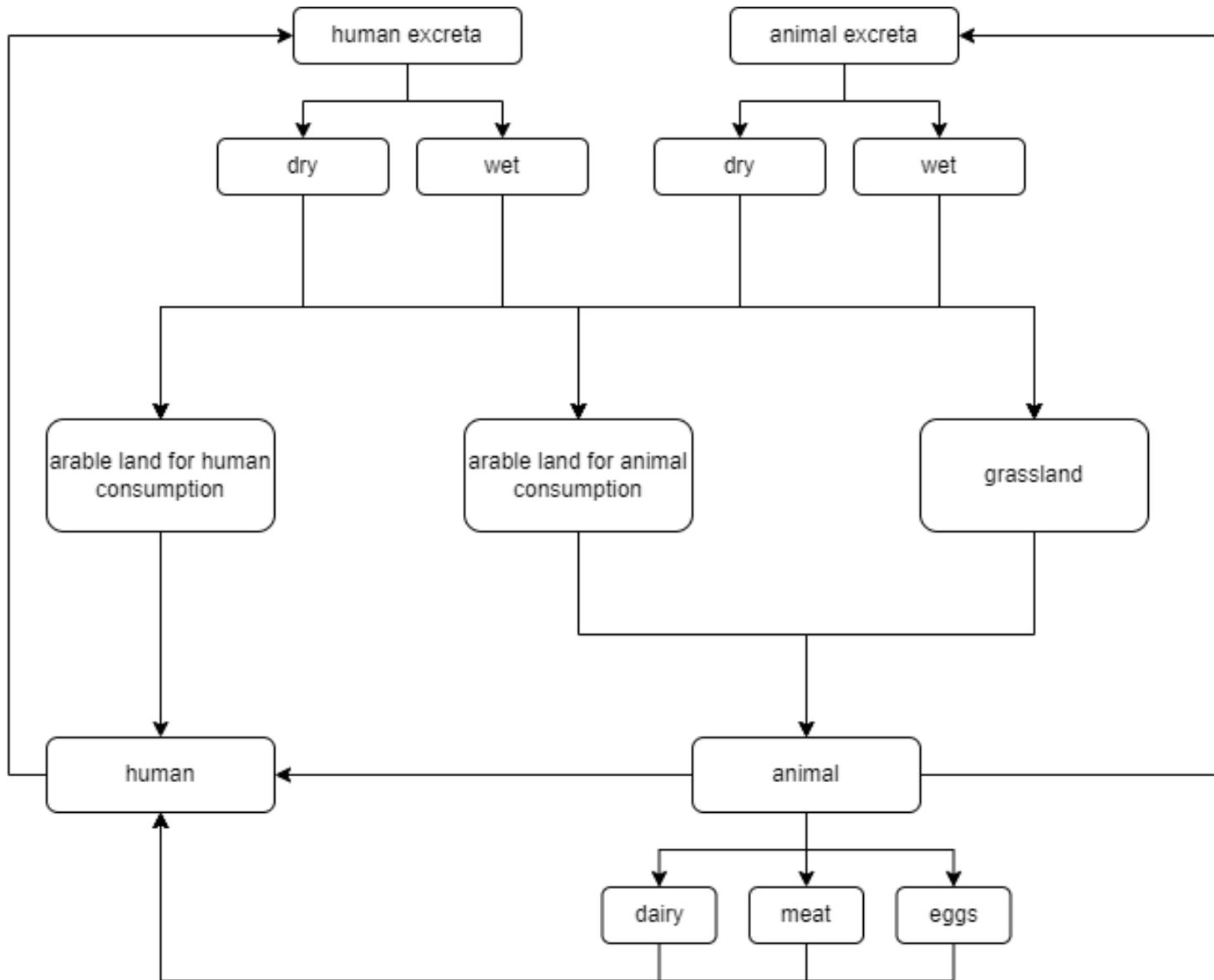


SARS-CoV-2

- Developed a tool for restaurant owners to limit spread of infection, together with TU Delft and Erasmus MC
- Transmission experiments and evaluation of field data
- QVE members involved in Red Team and frequent contributions to popular and news media



Microbial hazards in circular farming



MSc education

Specialisations Animal Sciences

- Genetics and Biodiversity
- Nutrition and Metabolism
- Global and Sustainable Production
- Adaptation, Health and Behaviour
- Molecule, Cell and Organ Functioning
- Animal Ecology

Internship, Research Practice and MSc thesis

- Internship (24-39 ects; mostly: 24)
 - Should contain a research component
- Research practice (24-39; mostly 24)
 - Instead of a 2nd thesis at QVE
- MSc thesis (24-39 ects: mostly: 36)
- Two course codes exist → contact study advisor



Some recent examples

- Distribution of mosquito species NL
- Comparison of dry off interventions in dairy cows
- Genetic selection of cattle
 - TB Ireland
 - Digital dermatitis NL
- Pig transports and ASF control Denmark
- FMD outbreak Indonesia
- Swine influenza NL

Prerequisites

- One (depending on subject) or both of the following MSc courses:
 - Quantitative Veterinary Epidemiology (P5, QVE-30306)
 - Management of Infections and Diseases in Animal Populations (P6, QVE-30806)

- Other useful knowledge:
 - Modern Statistics for the Life Sciences (P5, ABG-30806)
 - Economics of Animal Health and Food Safety (P2, BEC-52806)

Planning

- Contact study advisor for approval of MSc study program
- Intake: 3-6 months before start with Bart van den Borne

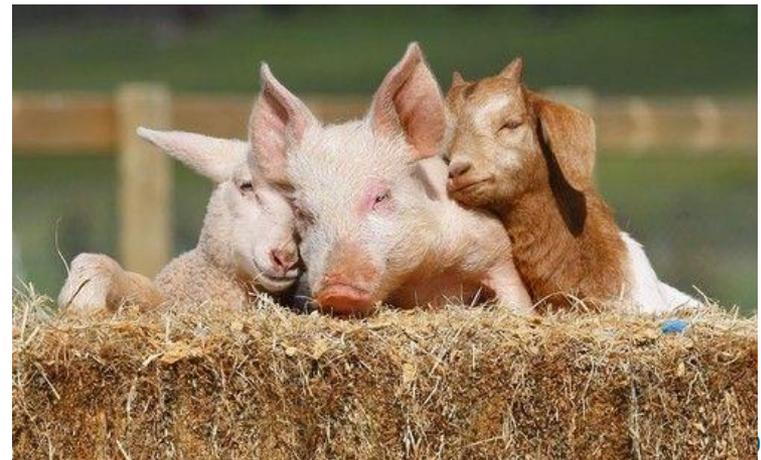


MSc thesis: what can you do?

- Experiment (transmission/challenge)
- Questionnaire
- Field work
- Statistically analyse dataset
 - Risk factors
 - Disease dynamics
- Simulation modelling
 - Disease dynamics
 - Economic impact
- Combination

Choosing a topic

- Methodology: risk factors, modelling, lab work
- Applied or more fundamental
- Type of work: experiment, questionnaire, field work, statistically analyse data, simulation modelling, combination, ...
- NL or abroad
- Supervisor / particular disease



Location

- Internal:
 - Zodiac / Radix
 - Combination with other chair group
- External:
 - Royal GD (Deventer)
 - RIVM (Bilthoven)
 - WBVR (Lelystad)
 - Fac Vet Med (Utrecht)
 - Industry (VION, MSD)
- Abroad

Species

- Cattle
- Pigs
- Poultry
- Small ruminants
- Companion animals
- Wildlife



A lot is possible!!

What do you prefer!?

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