Overview Thesis Topics BEC

Frederic Ang

- GHG emission efficiency in Dutch dairy farms
- Nitrogen efficiency in Dutch dairy farms
- Modeling soil organic matter in efficiency analysis: An application to Dutch dairy farms
- Marginal abatement costs of nitrogen reduction in Dutch dairy farms
- Assessing the effectiveness of phosphate quota: An application to Dutch dairy farms
- Comparing productivity measures of French meat-processing firms

Bart van den Borne

- Mycoplasma bovis - Estimation of the farm level economic impact of Mycoplasma bovis, an emerging pathogen in European dairy herds, using a bio-economic simulation model.
- Decision making of dry-off strategies in dairy cows - Dairy cows at the end of their lactation are commonly treated with antimicrobials to optimize their health after the next calving. Society is striving for a lower antimicrobial use but this may come at the costs of a poorer health and welfare of the animal. Quantifying the preferences of farmers and veterinarians in this regard would be beneficial to optimize the strategies that potentially can be applied. Using a conjoint analysis, these preferences will be assessed for the Danish situation. In a subsequent multi-criteria decision analysis, these preferences will be utilized to rank different dry off strategies based on multiple, conflicting criteria.

- Economic impact of zoonoses in developing countries - Zoonotic diseases impact the productivity of both animals and humans, especially in developing countries where the income of small animal holders heavily depends on the productivity of their animals. This study will determine the economic impact of a zoonotic disease for a country of choice.
- Disease burden of Hepatitis E or Livestock-associated MRSA – Pigs are carriers of Hepatitis E virus and MRSA, which can cause disease in humans. This project will assess the disease burden of these pathogens for the Netherlands.
- Cost-utility analysis of an intervention to a zoonotic disease - Modelling the cost-effectiveness of an intervention to mitigate the public health burden of a zoonotic disease (disease can be chosen by the student).
- Cost-effectiveness of a citizen science monitoring system for mosquitos - To monitor mosquito populations in the Netherlands, the general public is currently requested to submit dead mosquitos to Wageningen University. In this project, the cost-effectiveness of this citizen science approach will be compared with more traditional surveillance systems for monitoring mosquito populations.

- Changing human behaviour to control epidemics – The COVID-19 pandemic has clearly demonstrated that human behaviour is key to control epidemics. In this project, an overview of areas in which human behaviour can be changed to control zoonotic epidemics will be created.
- Economic impact of Foot and Mouth Disease in Indonesia. Indonesia experienced a large outbreak of Foot and Mouth Disease in 2022. This project will determine the economic losses due to the disease outbreak in Indonesian smallholder dairy herds.

Tobias Dalhaus

- Estimating the impact of extreme weather on the financial performance of agribusinesses
- The impact of Russia's war on Ukraine on stock prices of agribusinesses
- Increasing financial resilience to extreme weather with insurance
- Developing financial tools to manage fertilizer price volatility
- The impact of weather shocks on pest occurrence: Implications for chemical input suppliers?

Ine van der Fels

- Cost and effects of the monitoring of a chemical contaminant (e.g. aflatoxins, dioxin) in the chain. The aim of this thesis is to evaluate the costs and effectiveness of the current monitoring of a chemical contaminant (you can choose) in a particular chain, e.g. the dairy or pork chain. You will develop a simulation model (in excel) for the chain, and the fate of the contamination through the chain. You will use secondary data as inputs. Then, you will define several scenarios for an initial contamination in the chain (e.g. via feed), and simulate this contamination through the chain. With the current contaminant monitoring in the different supply chain steps, you will assess to what extent the contamination will be detected (or not). You will also assess the costs of the current monitoring system, and evaluate the costs and the effectiveness.
- Mycotoxin related disease burden. In this thesis you will assess the disease burden (DALY) related to mycotoxins in Ethiopia. You will collect secondary data on the occurrence of mycotoxins in food products consumed in Ethiopia from scientific literature. You will use food frequency data on food consumption (will be provided). Based on these, you will estimate the human exposure to mycotoxins in staple foods, and the related disease burden, expressed in DALY. This topic is part of PhD research of a PhD student, originating from Ethiopia, and you will also be supervised by this student (in collaboration with another BEC supervisor).
- The monetary costs associated with a transition towards sustainable dietary patterns. This thesis will estimate the marginal monetary costs of more sustainable diets for Dutch consumers and to perform a cost-benefit analysis of switching towards more sustainable diets This thesis is part of PhD research project, and you will be partly supervised by the PhD student as well as other staff. Can also be an internship at Wageningen Food Safety Research.

- Explore methods for quantifying the effectiveness of food safety inspection plans. Food safety is an important concern for both public health and economic stability. Food safety inspection plays a crucial role in ensuring compliance with regulations and preventing foodborne illness. However, the effectiveness of different food safety inspection plans is not always clear, with limited resources, it is essential to identify the most effective inspection plan. This topic will explore methods for quantifying the effectiveness of food safety inspection plans, with the goal of comparing the effectiveness of different inspection strategies. Different food safety inspection plans could include the frequency of inspections, the type of inspections conducted, and the resources allocated to inspection activities. Data on food safety outcomes, such as reported cases of foodborne illness or violations recorded during inspections will need to be collected. The study will involve exploring potential methods for quantifying the effectiveness of inspection plans and applying the appropriate method to solve the research question. The findings of this study will provide valuable insights into the effectiveness of food safety inspection plans and inform policy decisions related to food safety. By understanding which inspection strategies are most effective, regulators can optimize their resources to ensure food safety while minimizing economic costs. Overall, this study will contribute to the ongoing effort to ensure food safety, benefiting public health and economic stability. This thesis is part of PhD research project, and you will be partly supervised by the PhD student as well as other staff. Can also be an internship at Wageningen Food Safety Research.

Julia Hoehler

- Scaling up the insect supply chain – sustainability assessment of setting up an insect cooperative in the Netherlands
- Developing a public goods game to understand contract choice in the food value chain
- Exploring risk attitudes of European farmers by using data from a Europe-wide replication study
- Systematic analysis of Open Science practices in Agricultural Economics
- CSR of cooperatives and investor-owned firms: a cross-sector comparison

Henk Hogeveen

- The economic consequences of use of antibiotics. In a large Danish project, data are available of more than 80 dairy farms regarding the use of antibiotics, occurrence of disease (mastitis, a cattle disease responsible for ~75 % of the antibiotic use) and prevention of disease. The economics of disease will be related to the use of antibiotics.
- Attitude of veterinarians regarding the use of antibiotics. During a conference for Danish veterinarians, we will collect data on the attitude of these veterinarians regarding use of antibiotics to prevent mastitis. These data need to be evaluated and analyzed. In a next step, work will be carried out on an existing mastitis bio-economic simulation model to enable a multi-criteria decision making framework for the use of antibiotics.

- Costs of cryptosporidium Cryptosporidium is a zoonosis. It can also be a problem in (young) calves. Recently vaccinations are becoming available and for farmers it is important aspect to weigh the costs of vaccination against the costs of cryptosporidium problems. In this research you are going to focus on an evaluation of the effects of cryptosporidium on calves. Farm data are possible where the performance of calves with and without cryptosporium are available. This information is then used to make a cost estimate.
- Costs of mycoplasma bovis. Mycoplasma bovis is an emerging pathogen in dairy cattle. The costs of this disease for the Dutch dairy sector will be quantified in this project, making use of an existing bio-economic simulation model.
- Economic impact of Foot and Mouth Disease in Indonesia. Indonesia experienced a large outbreak of Foot and Mouth Disease in 2022. This project will determine the economic losses due to the disease outbreak in Indonesian smallholder dairy herds.

Yann de Mey

- What opportunities for business analytics in agriculture 4.0? After the Neolithic, mechanization and green revolution, the next revolution in agriculture is based around data and digitalization. Leveraging the digitalization of agriculture, requires applying proper business analytics to make sense of the breath of data being collected on modern farms. This thesis will explore the opportunities business analytics have from the farmers' perspective.
- An econometric analysis of risk in EU agriculture. Based on the European FADN dataset (a very large harmonized dataset of farm accountancy data for all EU countries), this thesis will explore risk exposure in EU agriculture using stochastic production functions and panel data econometric models.
- Characterising and categorising risk in agriculture. The well-cited book by Hardaker et al identifies five categories of risk in agriculture: price, production, financial, personal and institutional. Agriculture has changed, however, and hence this classification is up for revision (e.g. "data" or IT risk is a novel type). Using a combination of empirically reported survey data and a literature review, this study will attempt to update the classification of risk in agriculture from a 2023 perspective.
- Sustainable risk management portfolios of EU farmers. This thesis will econometrically explore the driving factors behind how EU farmers select various risk management instruments that allow them to sustain their business. Particular attention will be given the diversity in tools (e.g. insurance versus diversification) and their interaction.
- Diversity of Risk Management Portfolios in Southern Ethiopia. This thesis will econometrically explore diversity in risk management portfolios, making use of rich primary panel data on Ethiopian households' risk perception, risk preferences and coping strategies. We will characterize risk management portfolios and explicitly recognize and measure the link between specific sources of shocks/risk and specific risk management tools.

Suggested MSc thesis topics Niklas Möhring:

- Sustainable crop protection under climate change.
- Global potential trade-offs between sustainable crop protection and food security.
- A global assessment of the economic and environmental resilience of sustainable crop protection.

Core domain of the specialisation Sustainable Supply Chain Analytics:

- Food-supply-chain level drivers and barriers of sustainable crop protection.
- Market developments towards supply-chains for sustainable crop protection .

Miranda Meuwissen

- Paved Paradise (Dutch movie/documentary on sustainable food systems, Boersma & De Vreugd). Which (parts of) Dutch food supply chains fit in the proposed 'paradise'?
- Business and supply chain impacts of the Russian invasion in Ukraine.
- Risk management / business continuity management (ISO22301). Which food supply chain actors apply this system?
- Risk management / country level contingency management. Which crisis plans do EU countries have?
- The 25 billion Euro transition fund for agriculture. How is the capital invested? Which sectors are prioritized? Are new sectors (insects, seaweed, ..) included?
- State aid for farms and other food & agri businesses. What are the practices in Europe for new sectors such as insects and seaweed?
- Develop a blueprint of a 'sustainable chain game' & test with companies of the 4TU-Redesign consortium. The aim of the game is to illustrate the economic and sustainability implications of different supply chain structures, sourcing strategies, and KPIs. The game should cover the whole chain (production, logistics, wholesale, retail).
- Profitability of high-tech and data-driven horticulture chains in the Netherlands – or controlled from the Netherlands. (Includes interactions with companies of the 4TU-Redesign consortium.)
- Application of the TNFD (Taskforce on nature-related financial disclosures) framework to a food supply chain (can be any/free to choose).

Monique Mourits

- Protein transition: from traditional animal-based towards more sustainable protein sources. Assessing the economic sustainability of the production chains of alternative protein sources. This assessment focuses on the internal costs of the production chain to evaluate its economic viability. Scenario analyses will be performed to account for regional differences among EU.

- Actual cost of milk production when considering its environmental impact (greenhouse gas emissions); what management measures can be considered to reduce this impact and what is the economic trade-off? Simulation study.
- Heifer rearing management in relation to overall economic performance: Heifer rearing is often considered as a kind of risk management tool in dairy farming; by raising more replacements than needed, farmers are able to replace a dairy cow rather quickly, if needed; what is the impact of this "excessive rearing" on the overall economic performance; especially given the production restriction in the form of phosphate rights? Stochastic simulation
- Economic impact assessment of the Brown Marmorated Stink Bug threatening EU fruit production 1. By the use of data from the EU Farm Accountancy Data Network, the impact of established BMSB infestations on insecticide use and agricultural production efficiency will be analysed by means of a Data Envelopment Analysis 2. Evaluation economic feasibility at farm level of the innovative control strategies) by means of scenario analyses using a stochastic partial budgeting model.
- Risk assessment of emerging non-native pests and diseases threatening European forests: Evaluation of the socio-economic impacts in case of an emerging non-native pest invasion. Stochastic simulation

Alfons Oude Lansink

- Analysis of the Risk-Return-ESG performance of stocklisted firms. Data from stocklisted firms can be analysed using different techniques such as Data Envelopment Analysis and econometric methods.
- Analysis of the efficiency of agribusiness firms using Data Envelopment Analysis or Stochastic Frontier Analysis
- Analysis of the performance of Sustainability Linked Bonds
- Analysis of the use and costs of sustainable finance of dairy processing firms in Europe.
- Analysis of the optimal financial structure of European cooperatives

Helmut Saatkamp

- Analysis of the 1-2-3-star system for broiler welfare on additional impact on environmental aspects such as Nitrogen, CO2 and particulate matter
- Comparison of species/commodities with regard of improving animal welfare and the resulting impact on particularly environmental externalities;
- Assessment of sector-wide costs of the current epidemic of Avian Influenza in The Netherlands;
- Cost-price analysis of alternative feed crops for dairy farms with enhancing effects of soil health;

- The farm-economic impact of a change in the pattern of EcoSystemServices provided by Dutch arable farms.

Jaap Sok

- Estimating the perceived economic value of environmental sustainability attributes in supply chains using survey experiments
- Explaining intentions (and determinants) of supply chain actors and entrepreneurs to improve sustainability issues using survey data
- How to improve sustainability reporting for performance evaluation of farms and other agribusiness firms?

Mariska van der Voort

- Exploring the economic value of potential dairy cow welfare improvements due to data-driven systems. Therefore an existing bio-economic simulation model will used, simulating the potential performances of data-driven systems.
- Study the minimal requirement of a data-driven system for lameness detection in dairy cattle to become economic viable.
- Determining the economic effects of BVDV introduction on large-scale intensive dairy herds in China. Therefore an existing dairy cow bio-economic model need to be adjusted to the Chinees situation.
- Developing a bio-economic model for simulating the economic effect of intestinal and/or blood mites in meat-producing (broiler) chicken. This research is part of the NWO ObSerVed-project.
- Cost-benefit analysis of the electronic nose (e-nose) based systems for early detection of intestinal diseases and/or red blood mite. This research is part of the NWO ObSerVed-project.
- Study if machine learning can improve the prediction on the economic impact of production diseases in dairy farms and how to include the interaction between production diseases.
- Economic impact of methane reducing measures in the Dutch dairy sector. In this research you can focus on which measures are or can be taken to reduce methane emission in Dutch dairy farms. Next you need to determine the economic consequences of applying such strategies on the average Dutch dairy farm
- Developing an economic model and study the (potential) economic value of the Digital Twin: Digital Future Farm (DFF). The DFF is built for arable and dairy farming for which the thesis will address one of these themes.
- Study the potential economic value of monitoring behavior for disease detection in pig production. Predicting a change in water intake in pig has the potential to early detect diseases like diarrhea. In a current study we use sensor water intake data on pen level from several farm to predict behavioral change and link to the disease status.

The thesis could be link to predicting diseases, but could also look at the next stage of the research to study the potential value in early detection with water intake data.

- Study the economic impact of SMART technologies on fish farming system in Indonesia. This research is linked to the INREF SMART-In-Ag project.