



<b>Job title</b>	Research Associate/Fellow in Mathematical Modelling in Biology	<b>Job family and level</b>	Research and Teaching Level 4 Training Grade/ Level 4
<b>School/ Department</b>	Division of Agricultural and Environmental Sciences, School of Biosciences	<b>Location</b>	Sutton Bonington Campus

## Purpose of role

This role is to develop mathematical models for spread of antimicrobial resistant bacteria in chicken manure and barns. The aim is to use the model to identify risk and mitigation factors for farm and manure management scenarios that can inform policy and practise. The role holder will work closely with experimental scientists and will integrate data from empirical research into the mathematical model.

	<b>Main responsibilities</b> (Primary accountabilities and responsibilities expected to fulfil the role)	<b>% time per year</b>
1	<p>Plan and conduct research in mathematical models for the spread of anti-microbial resistance profiles in chicken (broiler) litter and use the model to determine best practice for minimising risks. This includes:</p> <ul style="list-style-type: none"> <li>▪ Day-to-day responsibility for the conduct and satisfactory progress of modelling research, including interactions with laboratory scientists and UK and Argentine partners</li> <li>▪ Development of mathematical models, fitting models to experimental data derived by project partners and from other sources, carrying out sensitivity analyses on the model in order to identify risk factors, and carrying out Monte Carlo simulations of different farm and manure management scenarios with results to inform policy and practise</li> <li>▪ Keep meticulous records, prepare synthetic reports both written and verbal, and bring insights to the research as it develops and progresses</li> <li>▪ Communicate and interact with external collaborators on the project at CEH, Wallingford and at the Universities of Lincoln and Leeds to ensure effective integration between experimental, modelling and policy components of the programme</li> <li>▪ Work safely and responsibly with regard to School rules</li> </ul>	70%
2	<p><b>External communication of results</b> Write up results and present internally and externally as appropriate, reporting the research findings and outcomes as the project develops, including conference presentations and drafting manuscripts for peer-reviewed journals</p>	20%

3	<b>Key responsibility headline</b> Assist with organisation and running of, and contribute to, periodic project meetings and those with stakeholders.	5%
4	Undertake wider activities to ensure effective personal career development	5%

## Person specification

	<b>Essential</b>	<b>Desirable</b>
<b>Skills</b>	<ul style="list-style-type: none"> <li>▪ Development and analysis of ordinary differential equation models of biological systems</li> <li>▪ Methods for fitting models to data</li> <li>▪ High proficiency in a relevant programming environment, e.g. R, Matlab or Python</li> </ul>	<ul style="list-style-type: none"> <li>▪ Bayesian model fitting techniques, e.g. MCMC</li> </ul>
<b>Knowledge and experience</b>	<ul style="list-style-type: none"> <li>▪ Excellent English language oral and written communication skills, including the ability to author research articles, and to communicate complex ideas to non-specialists</li> <li>▪ Outstanding publication record commensurate with career stage</li> <li>▪ Commitment to aims of the project in line with longer term career development</li> </ul>	<ul style="list-style-type: none"> <li>▪ Experience of effective working in a team with experimental scientists</li> </ul>
<b>Qualifications, certification and training (relevant to role)</b>	<ul style="list-style-type: none"> <li>▪ PhD awarded or near successful completion in relevant mathematical, statistical or computational approaches in the biological sciences</li> </ul>	<ul style="list-style-type: none"> <li>▪ Research area specifically in microbiology or antimicrobial resistance</li> </ul>



The University of Nottingham is focused on embedding equality, diversity and inclusion in all that we do. As part of this, we welcome a diverse population to join our work force and therefore encourage applicants from all communities, particularly those with protected characteristics under the Equality Act 2010.

## Expectations and behaviours

The University has developed a clear set of core expectations and behaviours that our people should be demonstrating in their work, and as ambassadors of the University's strategy, vision and values. The following are essential to the role:

- Valuing people** Is friendly, engaging and receptive, putting others at ease. Actively listens to others and goes out of way to ensure people feel valued, developed and supported.
- Taking ownership** Is clear on what needs to be done encouraging others to take ownership. Takes action when required, being mindful of important aspects such as Health & Safety, Equality, Diversity & Inclusion, and other considerations.
- Forward thinking** Drives the development, sharing and implementation of new ideas and improvements to support strategic objectives. Engages others in the improvement process.
- Professional pride** Is professional in approach and style, setting an example to others; strives to demonstrate excellence through development of self, others and effective working practices.
- Always inclusive** Builds effective working relationships, recognising and including the contribution of others; promotes inclusion and inclusive practices within own work area.

## Key relationships with others



