Health, zoonotic pathogens and parasites

RodentGate: future rodent management for pig and poultry health

Leirs, Herwig[1]; Vanden Broecke, Bram[1,2]; Sluydts, Vincent[1]; Belmain, Steven R.[3]; Meerburg, Bastiaan G.[4]; Jacob, Jens[5]; Szczotka-Bochniarz, Anna[6]; other members of the RodentGate team

[1] University of Antwerp, Department of Biology, Evolutionary Ecology Group, Antwerpen, Belgium
[2] University of Ghent, EcoBird, Belgium
[3] University of Greenwich, Natural Resources Institute, UK
[4] Dutch Pest & Wildlife Expertise Centre, Wageningen, the Netherlands
[5] Julius Kühn-Institut, Munster, Germany
[6] National Veterinary Research Institute, Department of Swine Diseases, Pulawy, Poland
* Herwig.leirs@uantwerpen.be

DOI: 10.20315/evmc.2025.165

Apart from consuming and spoiling animal feed, and damaging infrastructure in and around buildings, rodents are a considerable threat to animal and human health. They can cause direct stress in pigs and poultry but are mainly important as carriers of pathogens. They can pick up the infection from infected pigs or poultry and spread it within and between farms, act as a bridge between wild fauna and livestock, and maintain the infection locally when a farm is emptied and decontaminated after a disease outbreak or livestock turnover. An important approach for on-farm rodent control is the use of rodenticides but new restrictions on their use pose new challenges for efficient rodent management on farms.

The project RodentGate investigates rodent-related risks for animal health in the pig and poultry industry and how this might change with altered rodent control. For two years, the RodentGate consortium has trapped more than 650 rodents on pig and poultry farms in different parts of the UK, Belgium, the Netherlands, Germany, and Poland. Molecular analysis using qPCR has revealed that these rodents are harbouring various pathogens which are known to infect poultry and pigs, such as *Brachyspira* sp., pathogenic *Leptospira* species, *Salmonella* and *Lawsonia intracellularis*. Besides showing that these rodents harbour different infections, the consortium was also able to determine the rodents' individual movement and social behaviour, which were further used in epidemiological models. In addition to uncovering infections, the consortium has tracked the movements and social behaviours of individual rodents, which were then integrated into epidemiological models. These models allowed us to assess the effectiveness of different rodent management strategies on the transmission rates of different pathogens. Our findings suggest that merely reducing rodent populations through lethal means is not sustainable, as it may lead to a higher prevalence of disease in the long term. Instead, the most effective long-term strategy is to lower the carrying capacity for rodents on farms by limiting their access to food and shelter.