

## The Burden of Animal Diseases in UK Pork Production – part of the Global Burden of Animal Diseases (GBADs) Programme

**The project:** AHDB funded a six-month project carried out by the Universities of Liverpool and Bern to initiate the estimation of the Burden of Animal Diseases in UK pork production. It provides a basis for future work to understand resource allocation for animal health and welfare in the UK pork sector. The work was supported by the [Global Burden of Animal Diseases \(GBADs\) programme](#) that is funded by the Bill and Melinda Gates Foundation and The UK's Foreign, Commonwealth and Development Office (FCDO) and led by the University of Liverpool and the World Organisation for Animal Health (WOAH).

**GBADs** uses a systematic approach to determining the burden of animal diseases to provide consistent baselines to use in economic analyses. GBADs information can be used to: create **investment plans** which ensure there are adequate animal health systems; understand the **optimal allocation of resources** that most affect the health and wellbeing of livestock, and by association their keepers, consumers and the environment; and to **evaluate animal health investments** over time to ensure they are delivering on societal outcomes.

*How might burden information be used by a farmer?* Presently, farms spend money to control diseases (e.g. veterinary services and products). For a given expenditure, farms can expect to suffer a certain loss due to disease. An economic optimum exists where losses due to disease are most efficiently averted through expenditure, i.e., you get most bang for your buck concerning your investment in animal health. Burden information will help understand if farmers are achieving an optimal allocation to their animal health problems.

*How might burden information be used by the public sector?* At any given time, there are limits as to how much loss due to disease can be avoided by farmers' spending. There exists a residual loss that is unavoidable with the technologies available. It may be argued that focused public spending to improve the available technology (or to improve equitable access to technologies) is needed to address this unavoidable, residual loss.

Key findings from the project:

1. Data on population size is available from various national and international sources (e.g. DEFRA, AHDB, FAOSTAT, EUROSTAT). However, the granularity of the data varies widely, as does the actual pig population size during the year. The estimated biomass of the breeding population was 98,692 tonnes and 175,091 tonnes for the fattening pig population, respectively. The biomass of the entire UK pig population was estimated at 273,949 tonnes. The mean capital value of the entire UK pig population was estimated at £399.6 million.
2. Diseased farms (current state) showed substantially lower output (animals and revenue) than the healthy farms free from all possible causes of animal disease burden. Furthermore, diseased farms also showed lower animal input, mainly caused by the decreased efficiency and throughput. Overall, 188,536 fewer working sows, 937,316 fewer weaners and 448,330 fewer feeders would be required in a disease-free utopia scenario to achieve the current production output (pigs slaughtered per year) with disease.
3. The annual Animal Health Loss Envelope (AHLE) for a medium-sized breeding farm was estimated to be £394,000, for a rearing farm £156,000 and for a fattening farm £246,000. Estimates for an entire UK production stages were £343 million, £140 million and £375 million for the breeding stage, rearing stage and fattening stage, respectively. For the overall UK pork production system, the AHLE was estimated at £858 million per year.

Further work is required with the industry to identify the current levels of animal health expenditure including the costs of pharmaceuticals and veterinary services at farm-level plus the investment by the industry and government on research, education and coordination. Joint work is also needed to set the ideal health state and its parameterisation and access disease surveillance data to support attribution of losses and expenditure in the animal health loss envelope to specific causes. We would like to hear from those in pork production and allied industries who may be interested in co-designing the next stages of this work. Please email [gbads@liverpool.ac.uk](mailto:gbads@liverpool.ac.uk) if you would like to participate.

### Appendix - Definitions

*Animal: (Livestock, not companion animals):* an economic entity with a purpose, determined by humans, to convert inputs (e.g. feed, water) into more desirable outputs (e.g. milk, meat or eggs). The efficiency with which livestock perform this transformation of inputs into outputs can be determined by their health. By quantifying the impact that livestock diseases can have on resource use, food security, and increase of associated issues such as antimicrobial resistance and zoonoses, we can better understand the level of investment that might be appropriate in order to mitigate these issues, and where best to direct it.

*Disease:* GBADs looks at animal health and classifies disease in three broad categories: infectious, non-infectious and external forces (e.g. accidents, injury). The burden includes all of these disease elements (but not, for example, a change in genetics) and is bounded by a loss envelope. The loss envelope is the difference in economic performance in the presence and absence of diseases.

*Health:* A description of state of disease. Ideal health corresponds to absence of diseases. Diseases are defined as above, into categories: infectious, non-infectious and external forces.

*Burden:* Examples of animal-level burden include mortality (e.g. caused by premature death or early culling), and morbidity (e.g. increased input resources per animal or decreased yield of useful product per animal). Farm-level costs can also create societal burdens (e.g. food prices and availability, use of drugs (e.g. antimicrobials, antiparasitics) and hazardous chemicals in food production, total resources used, greenhouse gas emissions and animal welfare).