THE UNIVERSITY *of* EDINBURGH
**The Royal (Dick) School
of Veterinary Studies**

ROSLIN

CIEL
Centre for Innovation
Excellence in Livestock

Large Animal Research and Imaging Facility (LARIF)

Understanding how Salmonella bacteria colonises farm animals and causes disease

Challenge

Salmonella is a harmful bacterium of global importance. It can cause severe infections in farmed animals and passes through the food chain and farm environment to humans where it causes diarrhoeal illness. Salmonella is estimated to infect over 78 million people each year, resulting in 59,000 deaths. Although vaccines and biosecurity measures have been partly successful in reducing contamination of poultry meat and eggs, a pressing need exists to combat Salmonella in livestock, where it can cause diarrhoea, abortion and typhoid-like disease.

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Action

Work by researchers at the University of Edinburgh Roslin Institute has provided valuable insights into how Salmonella colonises the intestines of farm animals and produces disease. This has involved the use of novel sequencing-based approaches to determine the function of thousands of Salmonella genes during infection, with minimal use of animals, and to assess the risk of different strains. The research team also uses surgical models to study how Salmonella causes gastroenteritis and escapes the gut to cause disease in other parts of the body.

The LARIF has facilities to inoculate cattle, pigs and chickens with Salmonella, as well as other Hazard Category 2 pathogens, including those that have been genetically modified.

The surgical models and genetic approaches used by the Roslin team greatly reduce the number animals needed to study bacterial pathogenesis.

Impact

Enhancing our knowledge and understanding of Salmonella significantly increases the chance to successfully mitigate the health and economic impacts of this important zoonotic disease.

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