

# Development of an Integrated Neonatal Survival and Sustainable Antibiotic Plan

## Year 1 results



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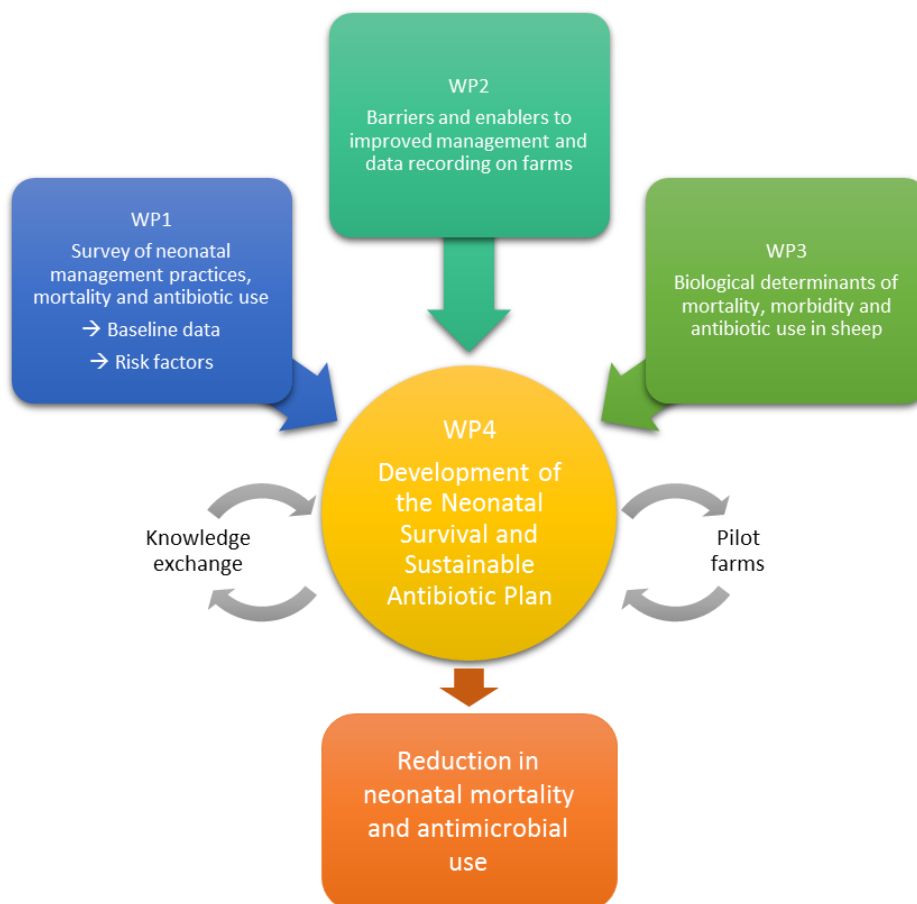
## Project aim

The aim of this project is to benchmark, define the risk factors for, and propose an integrated control plan to improve survival and reduce morbidity and antibiotic use in neonatal lambs and suckler calves in Great Britain.

## Project plan

The project consists of four work packages. The first three work packages (WP1-3) aim to capture current practice on GB sheep and suckler farms, define the barriers and enablers to improving neonatal survival and explore the biological determinants of neonatal lamb mortality and morbidity.

The final work package (WP4), integrates the findings of WP1-3 with existing knowledge in the literature, to develop and pilot a neonatal survival and sustainable antibiotic plan.



## Current progress

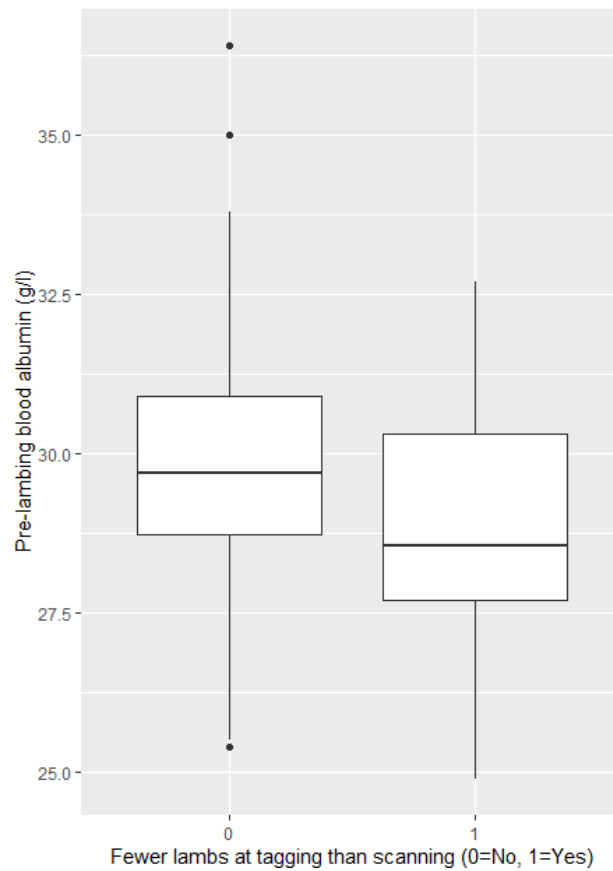
The project started in September 2018 and is due to finish August 2020. WP1-3 are now largely complete, with these three work packages now in their final data analysis and publication phase. WP4 is currently in the pilot phase, with the control plan being piloted on approximately 40 farms in England and Scotland.

## Key findings to date

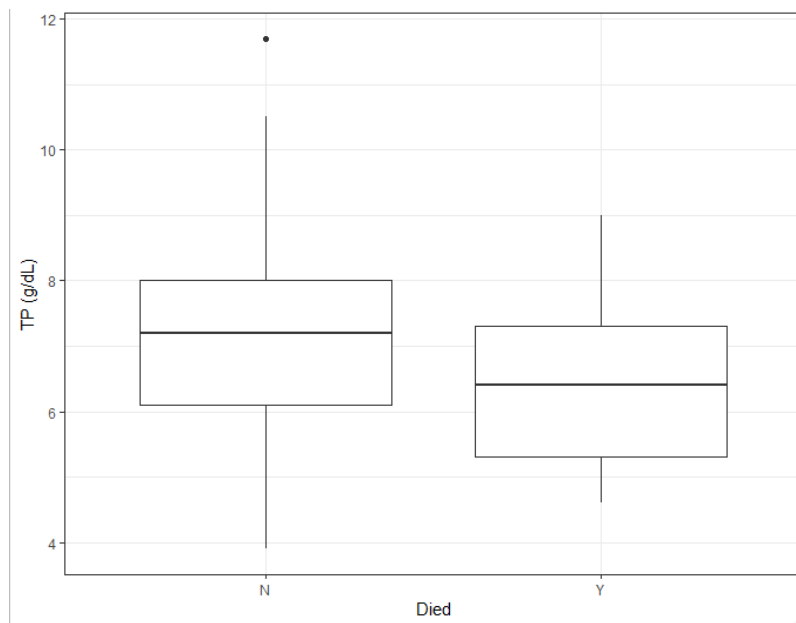
- In the farms that participated in the study:
  - o Mean lamb mortality in first month of life was 10.4%
  - o Mean calf mortality in first month of life was 7.5%
  - o The majority of mortality in lambs (9.5%) and calves (6.0%) occurred in the first 7 days of life
- Neonatal survival is important to farmers, who demonstrate autonomous motivation to improve neonatal survival and feel confident in their abilities
- Reported management practices are not always in keeping with current industry guidelines, suggesting that time and resources are not necessarily being deployed in the most productive ways
- Medicines records show that most beef and sheep farms are able to manage infectious disease, whilst maintaining production, without purchasing fluoroquinolones, 3<sup>rd</sup>/4<sup>th</sup> generation cephalosporins or colistin
- Prophylactic oral antibiotic treatment at birth in a well-run flock does not improve lamb survival or performance
- Poor long-term protein status in late pregnancy (low blood albumin) is predictive of increased lamb loss between scanning and 24 hours old and an increase in the number of lambs identified as poor at birth (Figure 1). Further work is necessary to determine whether this is due to concurrent disease (e.g. liver fluke) or poor dietary protein supply during pregnancy
- Lambs identified as poor at birth have poorer live weight gains to weaning
- Serum total protein at 8-24 hours old trends lower in lambs that die before weaning (Figure 2,  $p=0.07$  in a flock with an overall mortality rate between 24 hours old and weaning of 4%)



**Figure 1: Blood plasma albumin concentrations two weeks prior to lambing in ewes that lost lambs between scanning and tagging at 24 hours old versus those that did not lose a lamb**



**Figure 2: Lamb serum total protein (TP) concentration at 8-24 hours old plotted against death from 24 hours old to weaning (4% overall mortality)**



## Knowledge gaps

This project has identified a number of knowledge gaps relating to neonatal lamb and suckler calf survival. These include:

- A poor understanding of the risk factors for low blood albumin in ewes in late gestation. These are likely to be nutritional in origin, however iceberg diseases e.g. Johne's disease and other diseases like lameness and liver fluke may also be important. This is currently being investigated via a follow on project with HCC
- A limited evidence base to guide when to intervene during lambing/calving and the best way of learning these skills
- A limited evidence based to inform the design of appropriate field shelters for lambs
- A limited evidence base as to the best approach in the management of cows that lose calves in a suckler herd and the optimum management of triplet lamb litters
- A lack of cost-benefit analysis relating to the level of supervision at lambing/calving (training vs. experience, ratio of stock to staff, continuous vs. intermittent supervision)



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