Moredun Group

Moredun Foundation

Moredun Research Institute

Pentlands Science Park

Moredun Scientific Ltd
Company Divisions

Animal Health
Safety and Efficacy testing of livestock veterinary medicinal products.

Biosafety Testing
Testing of raw materials, cell lines, virus seeds, bulk harvests and final biological products for adventitious

Aquaculture
Safety and Efficacy testing of fish health products.

Crypts
Preparation of material for operator compliance testing for water companies
Animal Health

- Proof of concept studies
- Safety Studies
- Challenge Model Development and Validation
- Efficacy Studies
- Marketing Studies (licensed products)
- Sample Preparation
- Sample Testing
Efficacy Studies

Studies are conducted in compliance with relevant guidelines (VICH GCP) for all types of pharmaceutical and biological products.

**Studies conducted include:**

- Dose confirmation / Dose Determination
- Duration of Immunity
- Onset of Immunity
- Foetal protection
- Therapeutic / Prophylactic antibiotic therapy
- PK and PK/PD integration *ex vivo* or *in vivo*
Disease Models

- Broad range of disease models available for commercial use
- Ongoing development of new models to meet requirements of the industry
- Challenge model studies in a range of livestock species
- Models designed in line with regulatory requirements and some with multiple applications (prophylactic, therapeutic etc).
Why do we need disease models?

• Prior to licensing, veterinary products need to be shown to be effective.

• This is done in a number of steps, but in later stages involves;
  1) Controlled trials at Contract Research organization's
  2) Field trials at commercial farms / surgeries

• In controlled trials the efficacy of the products is tested against pathogens (using experimental disease models) in the target animal species, with as many factors controlled as possible.

• In Field trials the efficacy of the products is tested in less controlled conditions against natural outbreaks of disease
Challenges of Developing Disease Models

• Healthy animals

It can be difficult to cause infection in healthy animals.

• Multiple factors combine to cause disease

Field infections are often exacerbated by other factors such as environmental conditions, stocking density, poor nutrition, concurrent infection etc

• Control of severity

Models should aim to be of sufficient clinical severity to allow realistic test of products but not so severe that products don’t have a chance of working and not so mild that the animals recover without the need for a product
Process for Development of Models

- Identify pathogen / disease model
- Identify appropriate strain and required characteristics (clinical history, clinical signs, pathogenicity, resistance profile etc)
- Validate laboratory growth (confirming reproducibility)
- Validate in-vivo model (confirming parameters to be monitored, end points etc)
- Confirm reproducibility of in-vivo model
- Develop supporting assays where appropriate
Actinobacillus pleuropneumoniae (various serotypes)

Mycoplasma hyopneumoniae

Pasteurella multocida

Porcine Reproductive and Respiratory virus (PRRSV) – Type 1

Also developing models of porcine respiratory disease complex which includes combinations of different pathogens to more closely mimic field infection
Other Porcine Disease Models

Reproductive Diseases
Porcine Reproductive and Respiratory virus (PRRSV) – Type 1

Enteric Disease
Salmonella typhimurium

Escherichia coli

Systemic Disease
Streptococcus suis – Serotype 2

Porcine circovirus type 2

Parasitic Disease
Ascaris suum and Oesophagostomum spp
Campylobacter jejuni
Salmonella enteritidis
Red Mites

Further poultry model developments are planned in the future.