



Royal Veterinary College
University of London

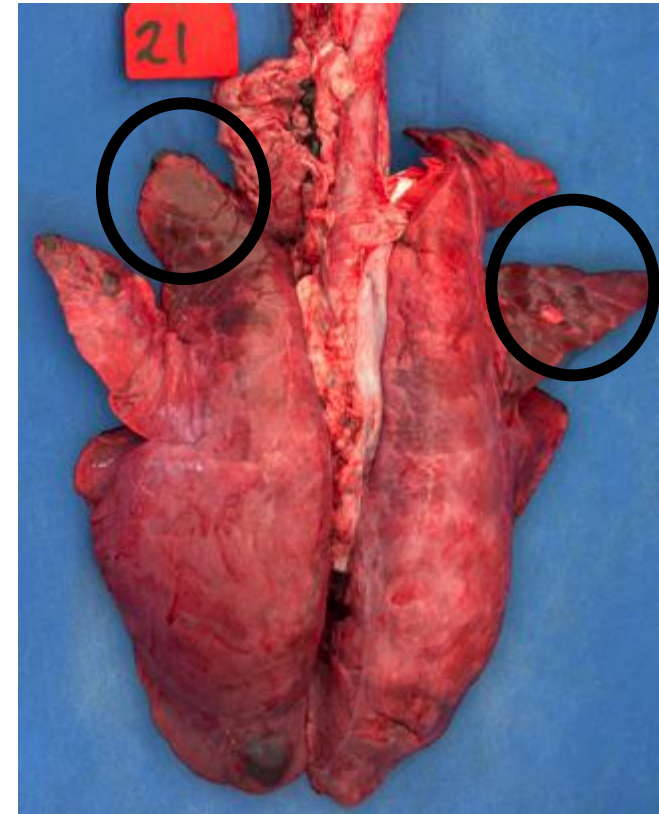
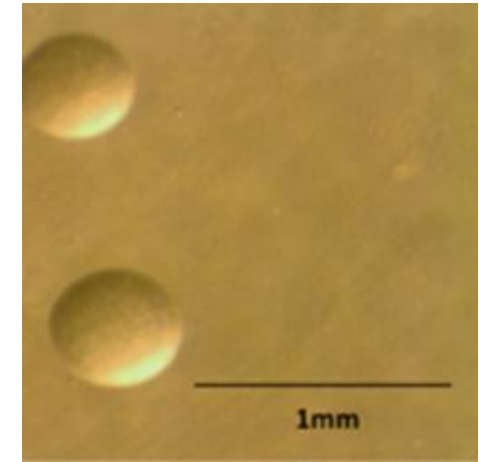
Reduction of *Mycoplasma hyopneumoniae* in the
environment of pigs:

Rethinking the future of disease control

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PhD student

Introduction: *Mycoplasma hyopneumoniae* (Mh)

- Causal agent of enzootic pneumonia (ep)
- Worldwide – growing pigs
- Clinical signs - coughing, reduced growth, prone to secondary infections
- Control – Vaccination. Improves growth rates, reduces secondary infections
- Treatment – antibiotics = **antibiotic resistance?**



Introduction: control methods

Silver ions

- Mechanism still not fully understood.
- Toxic effect potentially denaturing enzymes.

Photocatalytic paints

- Paint contains TiO_2
- Presence of water, oxygen and UVA light, free radicals formed destroying bacteria

UVC + air filtration

- UVC causes bacterial Thymidine molecules to bond to each other

Our *in vitro* analysis have shown that the 3 proposed methods inhibit *M. hyopneumoniae*

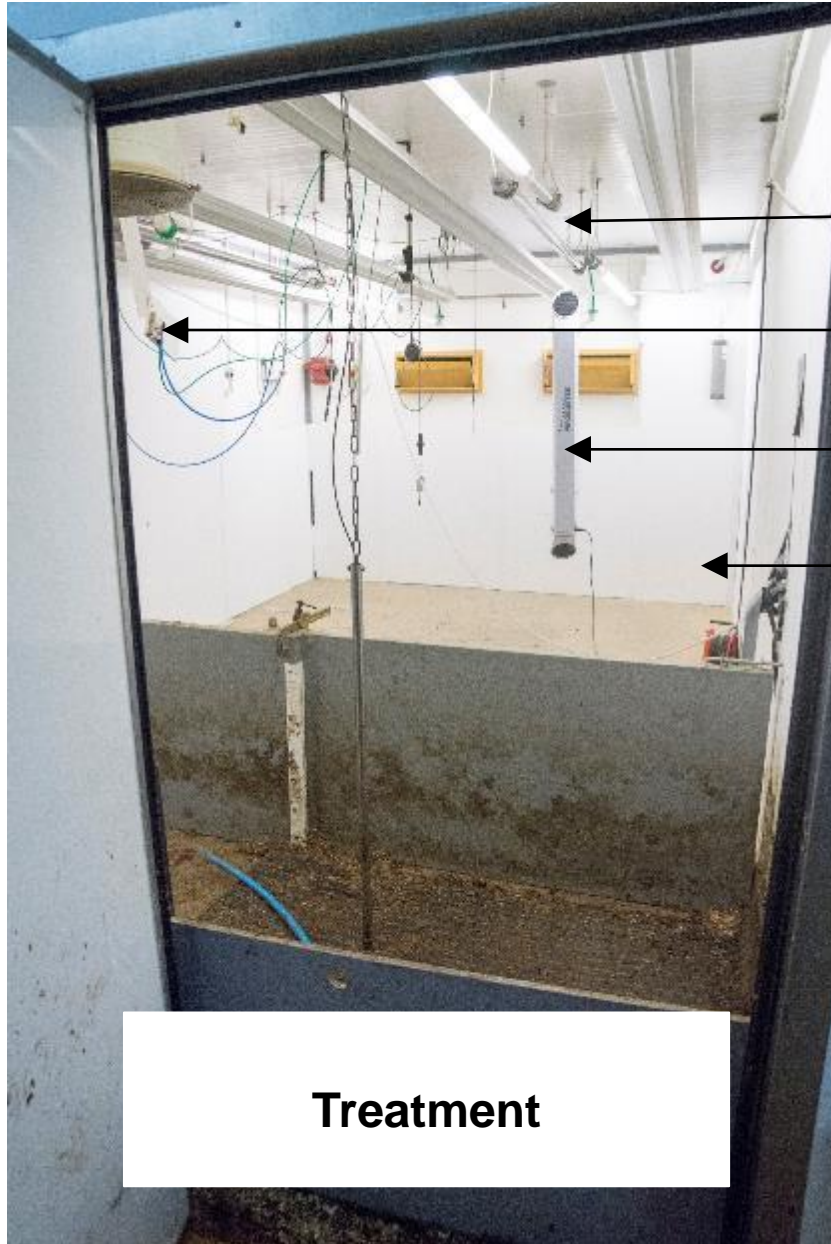
Industry focus

The pig industry needs to identify ways to reduce pathogen load (and hence challenge) of pigs and their environment and in so doing, reduce reliance on antibiotics to control disease.

Objective

Test *in vivo*, silver ions, UVC and TiO₂ paints in the environment of pigs and record pathogen reduction

Experimental room



Experimental design

- **Animal**

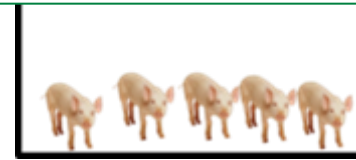
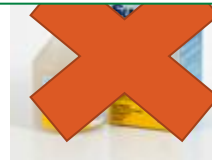
- Coughing (clinical signs)
- ep lung lesions

- **Room**

- General bacteriology
- Mycoplasma detection
- Air samples (*M. hyopneumoniae*)



VN



C

RVC

WK1

WK2

WK3

WK4

WK5

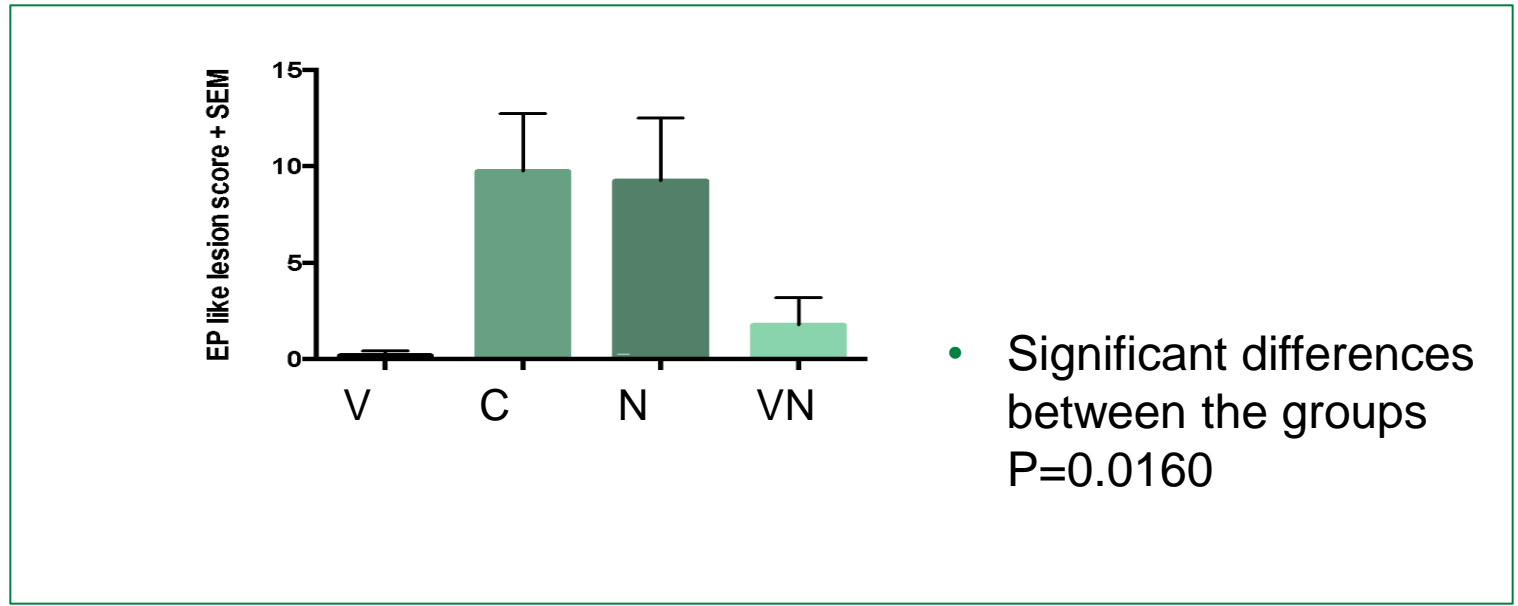
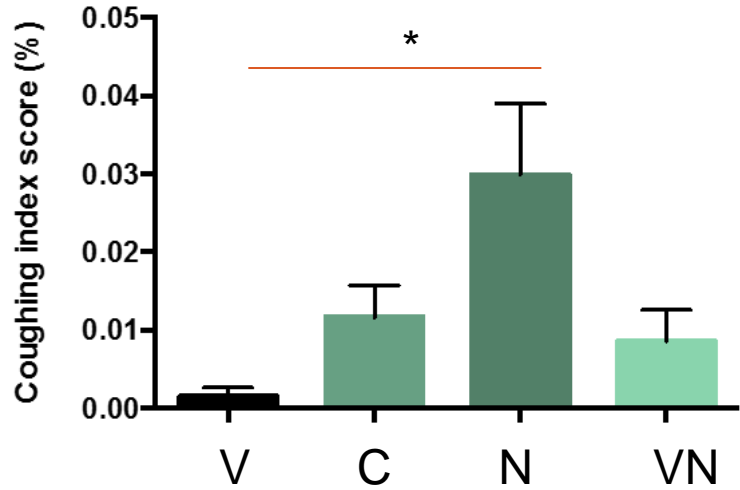


Results: pig

- Ep lung lesions

- Coughing

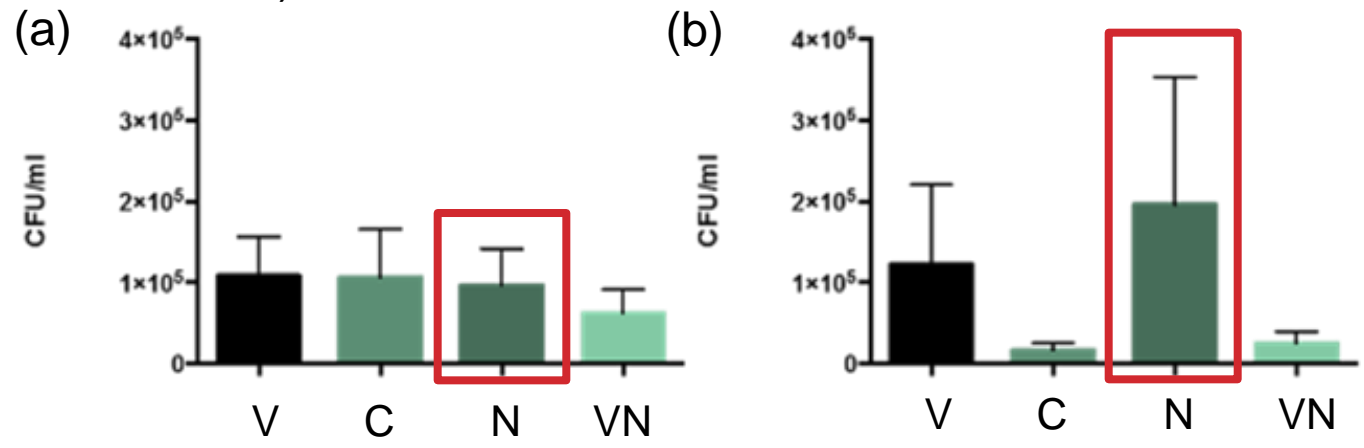
Significant differences between vaccination group and novel methods group (P=0.0096).



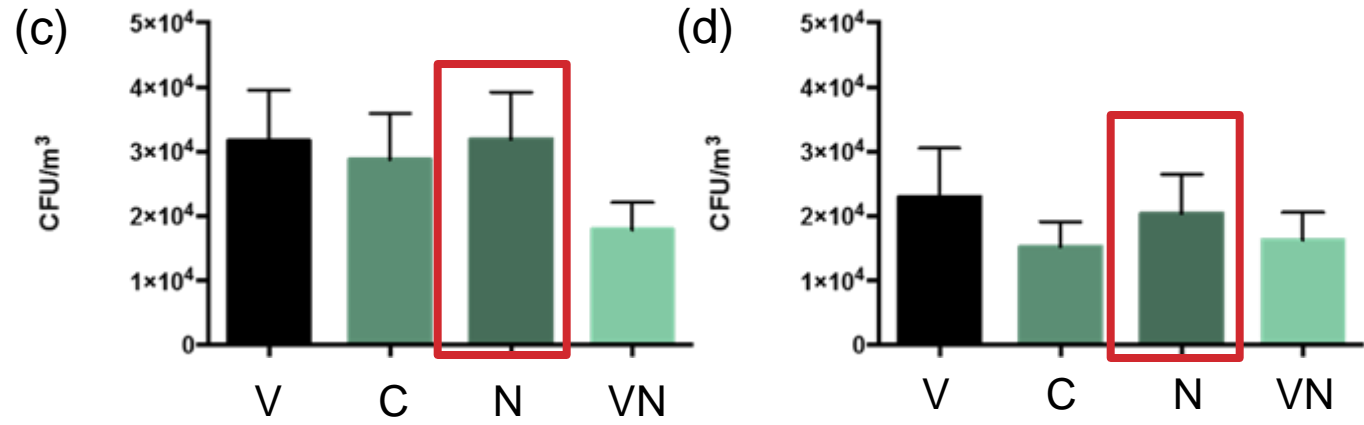
- Significant differences between the groups P=0.0160

Results – surface swabs and air samples

- Surface swabs on (a) Tryptone soy agar and (b) MacConkey agar (no significant differences)



- Air samples on (c) Tryptone soy agar and (d) MacConkey agar (no significant differences)

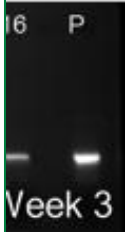
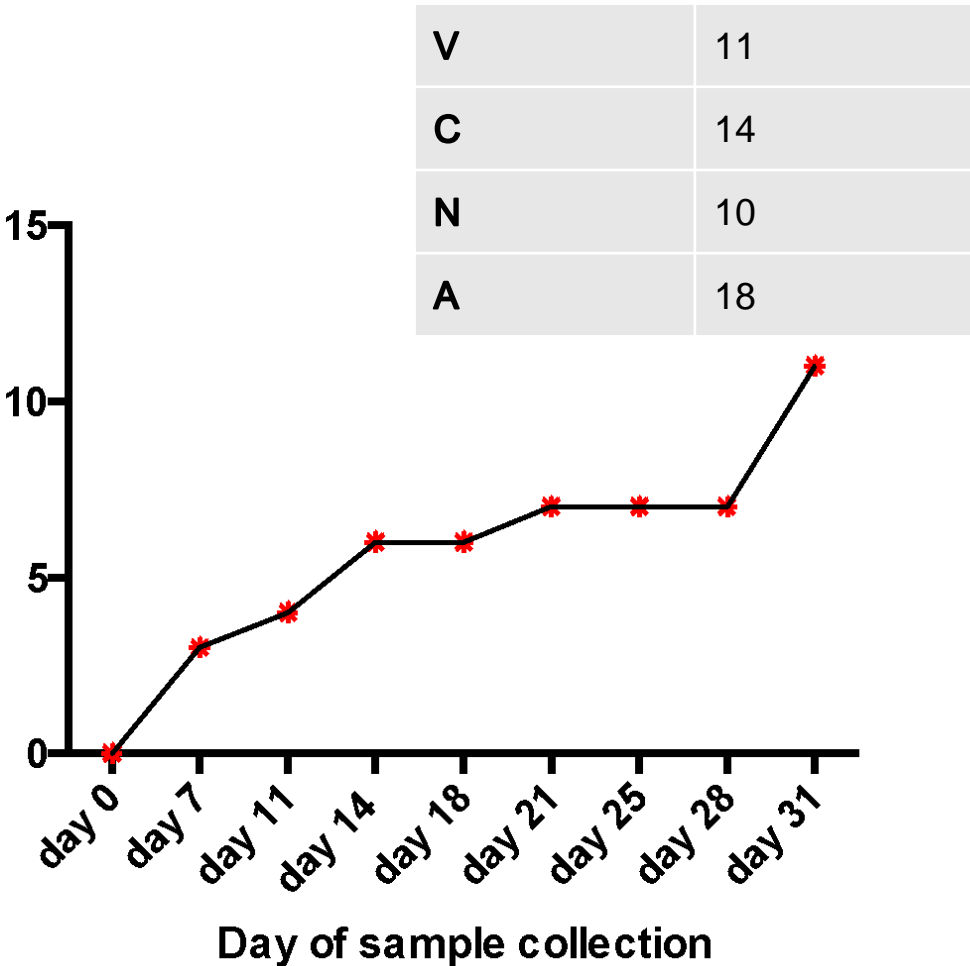


M. hyopneumoniae detection: culture

- 256 sam
colony w
- Nested F



Number of positive PCR samples (all groups)



Conclusions

- Our study has shown that the three methods did not reduce general bacteria from the environment.
- The true reduction of *M. hyopneumoniae* from the environment is unknown due to difficulties in culturing.
- The novel methods need to be refined in order to cope with environmental setting i.e. dust, contaminants.
- A lot more research is needed, as alternatives to antibiotics are a priority for agricultural practices.
- *M. hyopneumoniae* still remains an important pathogen that needs to be controlled.

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The Zoetis logo, featuring the word "zoetis" in a lowercase, orange, sans-serif font with a stylized wave-like underline under the 'z'.The BPEX logo, featuring the word "BPEX" in a bold, blue, sans-serif font, enclosed within a red oval border.