

Reduction of pathogen load in the environment
of pigs:

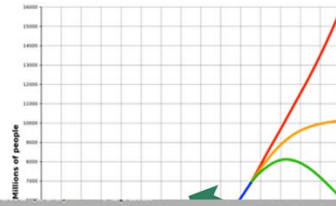
Rethinking the future of disease control

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PhD student – year 2

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Introduction

- World population is on the rise
- More pigs per unit.



NEWS HEALTH

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Antibiotics resistance 'as big a risk as terrorism' - medical chief

COMMENTS (1034)



By Fergus Walsh
Medical correspondent

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Or is it?!



Intensive farming . MN treatment relies heavily on ABCs and control is either ABC or vaccine or combination

Aim and objectives

Aim

To reduce *Mycoplasma hyopneumoniae* in the environment of pigs without the use of antibiotics.

Objectives

- Measure the duration of survival in *Mycoplasma hyopneumoniae* in the environment **(year 1)**
- Test *in vitro* - photocatalytic paints, silver ion solution and UVC air filtration **(year 2)**
- Test *in vivo* the above three mentioned applications **(year 2)**
- Molecular analysis of mentioned applications **(Year 3)**

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MN no bullet before objectives. Measure the duration of survival OF M. hyo IN THE ENVIRONMENT

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. In the longer term, this will help improve the health and welfare of pigs and may help reduce antibiotic resistance

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MN I think this could be reworded something like '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. in the longer term, this will help improve the health and welfare of pigs and may help reduce antibiotic resistance.'

Material and methods

- *Mycoplasma hyopneumoniae* 232 (Mh232) is used throughout all experimental procedures.
- UVC
 - Serial dilutions of Mh232 in Friis medium, 10µl were pipetted onto Friis plates
 - Mycoplasma were exposed to UVC for 5, 10, 15, 20 and 25 seconds
 - Colonies were counted 14 days later
- UVA and photocatalytic paints
 - Four different photocatalytic paints (P1, P2, P3 and H) were applied to tiles
 - Mh232 was pipetted onto the painted tile

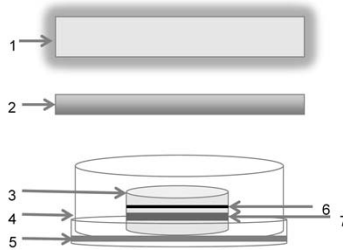
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MN Mycoplasma were exposed **to UVC for 5, 10.....**

Four different photocatalytic paints (P1..)were applied to tiles

Material and methods (continued)

- 1-UVA
- 2 – reducer
- 3- 3cm petri dish
- 4 – 5cm petri dish
- 5 – filter paper
- 6 – cover slip
- 7 – PAINTED TILE



•Experimental design

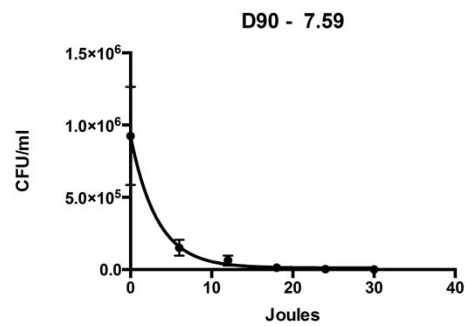
- Exposed to UVA (or no UVA as control) for 0,1,2,4 and 8 hours
- Painted tiles with Mh232 were washed with 450 μ l of PBS and pipetted onto Friis plates

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MN Experimental layout (DESIGN) should be moved lower (under the diagram). No mention of silver ion solution in M&M??

Results - UVC

- UVC reduces the number of colonies after 5 second exposure time
- The D90 value is 7.59 (takes 7.59 seconds to deactivate 90% of the Mycoplasma)

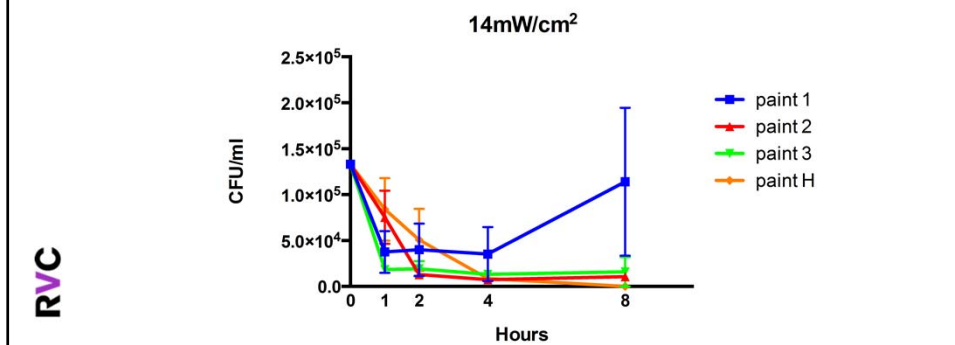


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MN diagram overlaps writing. These results are consistent... is discussion

Results – UVA and photocatalytic paints

- Paint H performed better than P1, P2 and P3.
- Total colonies after 8 hours were 0
- No flaking of the paint H was observed (P1, P2 and P3 did flake)



Remove 'remarkably' – the graph doesn't indicate this at all, it indicates that P2 and P3 are best?

Next steps:

In vivo application of the environmental novel methods

- N = 20 (LWxLR) pigs
- 5-6 weeks of age
- All groups were inoculated IT with Mh232
 - Group 1 - +ve control
 - Group 2 – vaccinated
 - Group 3 – novel methods
 - Group 4 – vaccinated and novel methods



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Cleansing devices is inconsistent terminology try to maintain consistency or you will lose the audience – you then talk about novel methods. Earlier it is applications

Samples and analysis – *in vivo*

- Animal
 - Weight
 - Nasal swabs
 - PM (lung scoring)
 - Coughing index
- Bacteriology and Mycoplasmaology
 - Andersen sampler
 - Environmental swabbing
- Molecular
 - Metagenomics
 - QPCR
 - Nested PCR

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MN remove data recording – Samples and analysis

Conclusions

- The *in vitro* analysis have shown that both UVC and photocatalytic paints have are efficacious in inhibiting growth of *Mycoplasma hyopneumoniae*
- Further analysis is needed from the *in vivo* work to establish whether these methods may be of benefit to the pig industry
- The changing global demands and attitudes to antibiotic resistance will put more pressures to reduce antibiotics usage in farm animals

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Third bullet – It is likely that pressure to reduce ABC usage in farm animals will increase

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