

# Alternative to antibiotics in pig production: A nano silver use trial

Hung Nguyen-Viet<sup>1</sup>, Huyen Nguyen-Van<sup>2</sup>, Trang Le-Thi-Huyen<sup>1</sup>, Fred Unger<sup>1</sup>, Thang Tran-Quang<sup>3</sup>, Yen Luu-Thi-Hai<sup>2</sup>, Khong Nguyen-Viet<sup>2</sup>, Hu Suk Lee<sup>1</sup>, Jane Poole<sup>1</sup> and Delia Grace<sup>1,4</sup>

<sup>1</sup>International Livestock Research Institute, <sup>2</sup>National Institute of Veterinary Research, Vietnam, <sup>3</sup>Vinh Phuc Animal Health and Livestock Sub-Department, Vietnam, <sup>4</sup>Natural Resources Institute, University of Greenwich

## Introduction

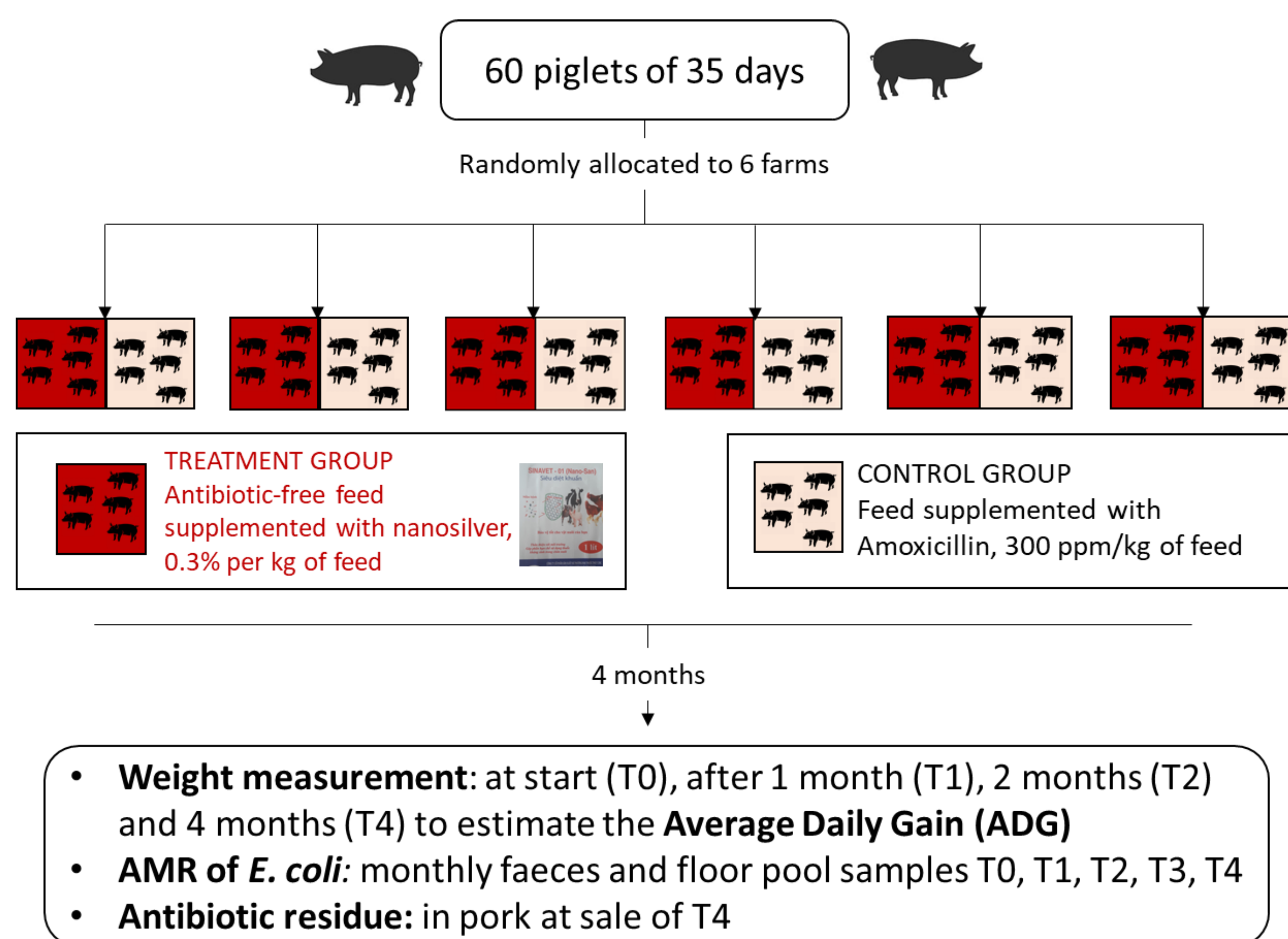
In Vietnam, around 80% of pork is produced by smallholder farmers who often use antibiotics for disease prevention and growth promotion due to their low cost and lack of knowledge or concern over antimicrobial use.

To reduce antimicrobial use in livestock, there is need to identify how farmers could benefit from reduction to motivate behaviour change.

**Objective:** To test an intervention at farm level to reduce antimicrobial use and antimicrobial resistance by replacing antimicrobials in feed with nano silver, an antimicrobial agent commonly used in surface treatments and packaging.

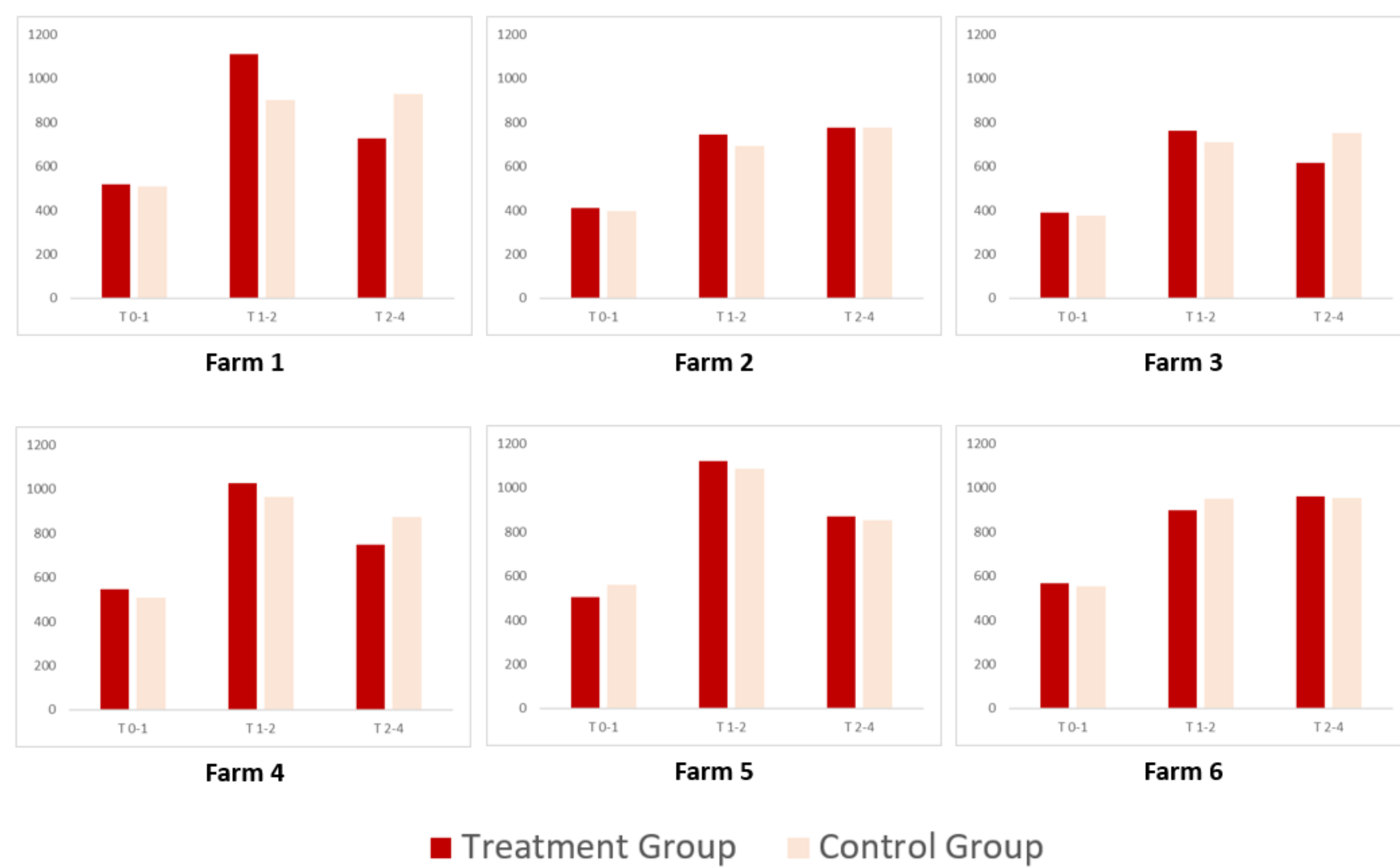


## Methods



## Results

### Average daily gain

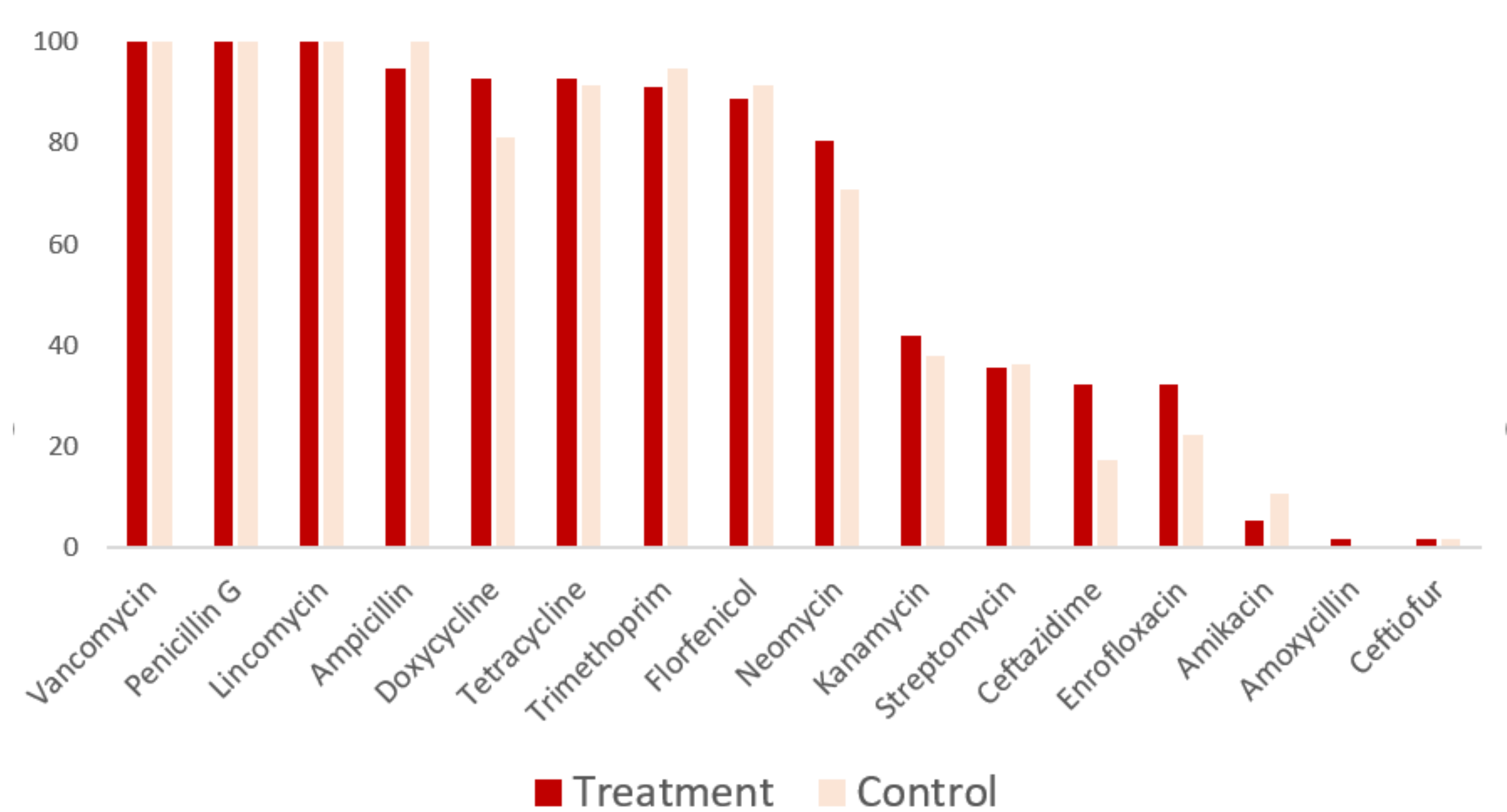


Average daily gain after different times of measurement (gram/day)

No significant difference observed between the control and intervention group at all times of measurement ( $p > 0.05$ )

## Results

### Antimicrobial resistance and antibiotic residues



Proportion of antimicrobial resistance detected between two groups

- Prevalence of *E. coli* in both faecal and floor samples was 100%
- High resistance rates to most commonly used antibiotics
- No significant difference in antimicrobial resistance profile of *E. coli* between the control and intervention groups
- No antibiotic residue was found in pork from the intervention group. One (out of six) pork sample of the control group was detected to have amoxicillin at 26.3  $\mu\text{g}/\text{kg}$  (vs. 50  $\mu\text{g}/\text{kg}$  as maximum residue limits for amoxicillin in pork) for a withholding period of seven days.

## Conclusion

- The use of nano silver as an alternative to antibiotics added to feed showed no difference in average daily gain or antimicrobial resistance profile of *E. coli* in small-scale pig production.
- The result of this trial suggests a possible alternative to antibiotic use in pig production to reduce antimicrobial use and antimicrobial resistance.
- Evidence of efficacy, cost-benefit analysis, acceptability to farmers, development of resistance, risk assessment for transfer to pork and an environmental impact assessment of nano silver are needed before scaling up its use.

## Acknowledgements

This study was funded by the CGIAR Research Program on Agriculture for Nutrition and Health. The assistance of the staff of Vinh Phuc Animal Health and Livestock Sub-department is deeply appreciated.

Hung Nguyen-Viet  
[h.nguyen@cgiar.org](mailto:h.nguyen@cgiar.org) • Box 30709 Nairobi Kenya • +254 20 422 3000  
 Nairobi Kenya • [ilri.org](http://ilri.org)



This document is licensed for use under the Creative Commons Attribution 4.0 International Licence. October 2020