



RESEARCH UPDATE

PigNutriStrat

Novel management strategies to reduce antimicrobial reliance and antimicrobial resistance on Irish pig farms

This project is a collaboration between Teagasc, South East Technological University and University College Dublin.

Background

The high use of antibiotics in pig production could promote the spread of antibiotic resistance from animals to humans. There has been an increase in restrictions on antibiotic usage in the EU since January 2022 and a ban of therapeutic levels of in feed zinc oxide (ZnO) put in place in the EU since June 2022. This is all happening at a time of unprecedented litter size increase, putting downward pressure on piglet health and weights and therefore, there is a need find alternatives to antibiotics.

Objectives

1. To determine the effect of different sanitisation regimes on pen hygiene, antibiotic usage, pig health and growth in farrowing and weaner accommodation.
2. To determine the effect of optimal sanitisation regimes with and without the use of a competitive exclusion agent (probiotic) in the farrowing house on pen hygiene, antibiotic usage, pig health and growth.
3. To determine the effect of different sanitisation regimes, stocking densities and feeder space allowances in weaner accommodation on pen hygiene, antibiotic usage, pig health and growth.
4. To determine effect of the different sanitisation regimes, stocking densities and feeder space allowances with and without pharmacological levels of ZnO in weaner accommodation on pen hygiene, antibiotic usage, pig health and growth.

Study 1. Investigation of sub-optimal versus optimal sanitisation regimes in the farrowing house

This study aimed to increase piglet growth and reduce the requirement for medication in suckling piglets by implementing an optimal sanitisation routine in farrowing accommodation. There were two treatments; (1) sub-optimal sanitisation: washing of pens with cold water, no use of detergent or disinfectant and minimal drying time (≤ 18 hrs), sows were not washed or disinfected; and (2) optimal sanitisation: detergent application allowing a contact time of 20 min, washing of pens with cold water, drying of pens overnight (18 hrs) using a blow heater, application of a disinfectant 24 hrs later and pens allowed 6 days of drying time, supplemented with a blow heater for the first 24 hrs, sows were washed with cold water and disinfected before they entered the farrowing room.

Parameters evaluated were total bacterial counts and *Enterobacteriaceae* counts (an indicator group of bacteria of faecal contamination) per cm^2 in the pen, individual piglet weights, average daily gain, mortality, clinical cases, number of injections, antibiotic and anti-inflammatory usage.

For more information visit www.teagasc.ie/pigs



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As a result of implementing the optimal sanitisation regime, the total bacterial counts and *Enterobacteriaceae* counts in the pen decreased and this was consistently seen in each area of the pen swabbed. An example of the results obtained can be seen in Figure 1, where total bacterial counts are displayed for the floor area behind the sow before washing and again at entry to the farrowing pens. After using the optimal sanitisation regime, the total bacterial count decreased by more than 400,000-fold in this area of the pen, while it decreased only ~30-fold using the sub-optimal regime.

Implementing the optimal sanitisation regime also had an effect on piglet performance, the number of clinical cases recorded per litter was reduced (- 86 %), leading to a reduction in the volume of antibiotics (- 77 %) and anti-inflammatories (- 75 %) that needed to be administered. As a consequence, piglet weaning weight was also significantly increased, seen in Figure 2.

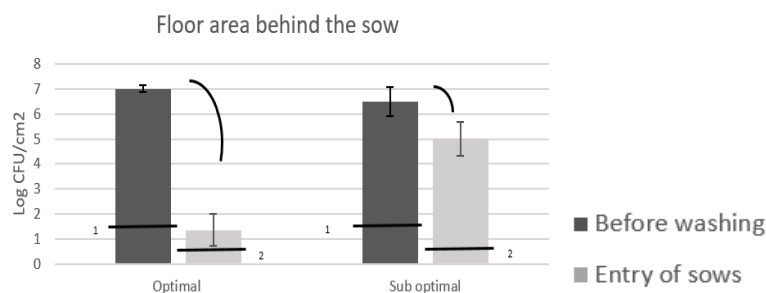


Figure 1 Total bacterial counts on the floor area behind the sow in Log CFU/cm²
 1 Limit of detection (LOD) before washing of pens
 2 LOD after washing of pens



Figure 2 Effect of the optimal cleaning and disinfection routine on weaning weights

Take home message

Implementing the optimal sanitisation regime;

- Decreased total bacterial and *Enterobacteriaceae* counts in farrowing pens
- Decreased clinical cases and number of injections administered to piglets
- Decreased antibiotic and anti-inflammatory usage in piglets
- Increased weaning weights of piglets