



RESEARCH UPDATE

WATERWORKS

Water footprinting & water use reduction of Irish pig production

This project is a collaboration between Teagasc & Wageningen University. It has a number of different components relating to water usage & water footprinting of the Irish pig sector. It will result in the development of best practice recommendations for water consumption reduction at farm level. This project will yield valuable information for the pig sector & environmental sustainability.

Background

Strict biosecurity protocols on Irish pig farms require thorough cleaning of pens to maintain a high animal health status. Moreover, it is a legal requirement that pigs >2 weeks of age must have permanent access to fresh water. Understanding water consumption hot-spots for direct (e.g. cleaning & drinking) & indirect (feed production) water usage in pig production, identifying on-farm usage patterns & identification of on-farm factors which can affect usage will help in the understanding of direct water consumption.

Objectives

- Quantify direct & indirect water footprints & identify hot-spots of water consumption for Irish pork production through intensive on-farm auditing & data collection
- Evaluation of the effect of pen washing procedures on water usage, environmental bacterial load of housing facilities & cleaning time
- Evaluation of the effect of group size & environmental enrichment provision on water usage

Study 1 - Water footprinting of Irish pig production

Quantifying the water footprint of pig production & identifying hot-spots of water consumption, aids in reducing the pressures on freshwater systems resulting from agriculture production, & will provide valuable producer information. Moreover, increasing the sustainability of pig production by reducing consumption of resources, such as water, further improves the marketability of our export industry.

Water meters have been installed throughout the 11 farms enrolled in the study, in each section of production & wash lines, to collect detailed measurements on direct water consumption. Data will be collected for approximately 12 months. The water footprint for the various feedstuffs on each farm (indirect water usage) is being determined. An infrastructure & management survey of each of these farms has been conducted. Models which are needed to analyse the water usage data are under development & all data will be analysed once collection of the meter data is complete.

For more information visit www.teagasc.ie/pigs



Study 2 - Effect of pen washing procedures

A number of strategies are used to thoroughly clean pig pens however; there is limited information available on how effective these strategies are at reducing bacterial load or the potential differences in water usage & time required for cleaning.

This study looked at the effect of three different washing treatments on bacterial levels, water usage & time taken to clean weaner pens. The three strategies were 1) washing & disinfectant, 2) pre-soaking, washing & disinfectant, & 3) pre-soaking, detergent, washing & disinfectant. Microbiology of the pen floor, wall, & feeder before & after using each technique was examined. We found no difference in the amount of water used however pre-soaking followed by detergent application reduced the cleaning time by 4.2 minutes (26.6%) per pen compared to only power-washing. There was no difference in the total bacterial count, or counts of Staphylococcus or Enterobacteriaceae, before or after washing showing that each method was as effective as the others for what was measured. Thus from a labour saving perspective, there are benefits to pre-soaking & use of detergent, without any cost with regard to water use.

Study 3 - Effect of group size & enrichment provision

Water wastage at drinkers can be an issue on pig farms. Irish farms operate using fully slatted systems, & excessive water flow or wastage increases the volume of the slurry & reduces the nutrient content, increasing operating costs. The amount of enrichment provided per pig & the group size can vary widely across farms, & can affect pig behaviour. All of which could potentially affect water usage & wastage.

Experimental work is on-going in the Moorepark Pig Research Facility relating to the effect of group size & environmental enrichment provision on water usage, wastage & pig performance

Shilpi Misra - Phd Candidate



Shilpi Misra is the PhD student working on the WATERWORKS project. She is supervised by Dr. Keelin O'Driscoll, Dr. Amy Quinn & Dr. John Upton from Teagasc & Dr. Corina Van Middelaar & Prof. Imke de Boer from Wageningen University. Prior to joining the project in 2018, Shilpi obtained an Erasmus Mundus International Master's degree in Environmental Technology & Engineering (IMETE) from Ghent University, Belgium, UNESCO-IHE, Netherlands & University of Chemical Technology, Czech Republic. She has over 6 years' experience in the environmental sector with a focus on climate change & its impact on agriculture & environmental conservation having worked with various national & international organizations prior to joining the project team. Her research interests are sustainable livestock production, life cycle assessment, environmental pollution & biodiversity conservation.