

## SUSTAINABILITY IN MCAULIFFE PIG FARMS

### Presenter

McAuliffe Pig Farms

### Description

Commercial pig production in Ireland is an indoor system. Therefore, it is not directly affected by climate change compared to a tillage or grassland-based production system. However, as 70% of the cost of production is related to feed, the effects of climate change on crops is a worry as this can affect the growing and harvesting of the crop leading to both scarcity and quality issues. Soya is the most common protein source for pig diets and is mainly grown in the USA and South America. The use of soya can contribute to deforestation and increased food miles.

Extreme heat can reduce feed intake in pigs and reduce productivity. Extreme weather conditions can also affect the ability of pig housing to remain energy efficient.

Water use is quite high in commercial pig production and the threat of water scarcity is an ongoing challenge, particularly in areas affected by water shortages. The farm has worked with pig nutritionists to reduce the amount of soya protein in the diet by 20%, which subsequently reduces the pig's ammonia emissions by 15%. Feed is frequently produced in areas removed from pig production, so it is important to look at ways to reduce on reliance on these feeds to continue to reduce greenhouse gas emissions. On the farm, pig slurry is not seen as waste, but as a valuable fertilizer. Farmers carried out research with clean-tech company Dionergy using their EL300 aerator in the slurry tank. Dionergy's treatment solutions are plug and go installations that sit on and floats on top of the waste in tanks.

Water scarcity is taken into account by collecting all the rainwater from roofs in large underground tanks to reuse for washing purposes. Rooms are washed and disinfected between each batch of pigs.

An additional investment regards the heating of piglets by plastic pads which are in turn heated by air to water heat pumps. These heat pads act as hot water bottles, as hot water is pumped into them. An air to water heat pumps system consist of four major elements that allow the refrigerant to pass from the liquid state to the gas: a compressor, a condenser, an expansion valve and an evaporator;

- A fan passes air over the evaporator, the refrigerant absorbs heat from the outside air. The refrigerant boils and evaporates at a low temperature giving us vapour;
- The vapour passes into the compressor and compression increases the temperature;
- The warm vapour is condensed in the heat exchanger and the rejected heat is passed onto the heating and hot water system;
- The condensed vapour returns to liquid, passes back through expansion valve, reducing pressure and temperature, ready to start cycle again.

All pig buildings have been renovated in recent years to improve insulation which controls temperatures more effectively using high grade insulation. Moreover, the farm uses high-tech ventilation control systems and ECBlue Low Energy Consumption ventilation fans.



## Results

The air to water heat pumps mentioned above has led to energy savings of up to 75%. This is the equivalent in oil terms of approximately 18,000 litres per year.

The use of rainwater harvesting system for cleaning and disinfection is just a small part of a biosecurity programme. As the farm runs a high health herd, farmers carry out measures to prevent the entry and spread of disease. All visitors must be 'pig clean' for 72 hours. All visitors including the team working on the farm must shower in each day. Fresh clothes and footwear are provided. Foot dips with disinfectants are used at the entrance of each pig house. Food safety is an important part of sustainable pig meat production and biosecurity practices help reduce food safety scares at farm level. High health standards lead to increased consumer confidence and increased production efficiency.

## Climate smartness

The practices promoted in pork production systems are mainly focused on reducing greenhouse gas emissions during the process to improve the adaptation of production systems, which are directly vulnerable due to climate variability.

Certain climatic conditions can stress the animals and reduce their productivity; moreover, pork production is highly dependent on water availability and feed, therefore when these are scarce prices may go up. This project is addressing all pillars of CSA focusing in reducing emissions, increasing productivity and reducing vulnerability of productive systems under a climate change context.

A capacity-building component on understanding and use of climate information may benefit the project goals. Participatory methodologies to strengthen the capacity of farmers in order to plan and manage their production system considering historic and future climate behaviour may empower them to make better-informed decisions on their activities. Weather forecast may provide elements to understand prices variability on relevant inputs for pork production. Moreover, it could guide decision making towards water storage practices.

