

PigGas Report 19 – 1200 sow, farrow to finish, conventional piggery, WA.

December 2013



Production details

This production system is a 1200 sow multiplier herd. It comprises a continuous flow farrow-to-finish site and a contract wean-to-finish, all in-all out, grow-out site. Replacement gilts are produced at the breeder site together with a proportion of pork and bacon sales. Pigs are delivered fortnightly to the grow-out site at weaning for finishing at around 108kg LW. The breeder unit is a conventional, naturally ventilated design with supplementary heat for farrowing and weaner pens. Weaners at the grow-out site are kept in deep litter shelters until around 14 weeks of age and then transferred to conventional natural ventilated sheds until sale.

Feed consumption

All feed for both units is prepared off-site with total consumption of 7,067 tonnes per year.

Sales/Tranfers

Around 20,600 weaners per year are transferred from the breeder site to the grow-out unit. A total of 48,450 pigs per year are sold from both sites which includes replacement breeding stock, pork and bacon weight animals giving a total dressed weight of 2,344 tonnes per year.

Waste management systems

Manure at the breeder site is automatically flushed from the sheds using recycled water. Effluent is flushed to a new 10.1ML anaerobic pond which then flows by gravity to a second anaerobic pond, then to a facultative pond and finally an evaporative pond. There are also two sludge drying ponds. At the grow-out site, spent litter is removed from the eco-sheds after each batch of pigs and liquid manure is regularly flushed from the conventional sheds into a series of three effluent ponds.



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Manure reuse systems

Evaporation is used at the breeder site to remove effluent from the system though effluent may be irrigated on the property if necessary. Ponds are desludged into the drying ponds and the solids removed off-site as required.

Spent litter from the shelters at the grow-out site is removed after each batch of pigs and spread on the property as fertiliser for pastures or crops. Liquid effluent is removed by evaporation from the ponds and solids may be spread on the property as required.

On-Farm Baseline Emissions

The current baseline emissions at the breeder and grow-out sites was **2,497 and 6,527 t CO₂-e/yr** respectively with an emissions intensity of **4.16 and 3.74 kg CO₂-e/kg HSCW**. The overall piggery baseline emissions totalled **9,025 t CO₂-e/yr** with an emissions intensity of **3.85 kg CO₂-e/kg HSCW**.

On-Farm Emissions Reduction Scenario

The majority of emissions on these sites come from the release of anaerobic pond methane. The potential to capture and use the biogas to generate energy at the breeder site was applied as the emissions reduction scenario for this piggery. It is planned to cover the purpose built anaerobic pond and capture and burn the biogas in a boiler to produce hot water for heating suckers and weaners. This will offset the current LPG used.

This scenario (see table below) reduced on-farm emissions at the breeder site **from 2,497 t/year to 542 t/year** and reduced emissions intensity **from 4.16 to 0.90 kg CO₂-e/kg HSCW**, a **78% reduction**. This reduction in emissions at the breeder site only resulted in an overall piggery enterprise intensity reduction **from 3.85 to 3.02 kg CO₂-e/kg HSCW (22% reduction)**.

Possible management practices that could be considered in future to further reduce on-farm GHG emissions include using the biogas to also co-generate electricity, reduce feed wastage and improve effluent spreading management at the grow-out site to reduce soil N₂O volatilisation and runoff.



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Annual Greenhouse Gas Emissions Profile (calculated using PigGas)

Emissions	Current Emissions Baseline (kg CO ₂ -e/yr)	Reduction Scenario (kg CO ₂ -e/yr)
Pre-farm		
Grain	1,766,758	1,766,758
Milling & delivery	339,218	339,218
Pig freight		
Straw & bedding	2,511	
Total Pre-farm	2,108,487	2,108,487
On-farm		
<i>Fuels & energy</i>		
Purchased electricity	40,688	40,688
Fuel - stationary	97,355	34,000
Fuel - transport		
<i>Enteric CH₄</i>	249,279	249,279
<i>Manure management</i>		
MMS CH ₄	7,772,517	5,864,454
MMS – direct N ₂ O	147,688	147,688
MMS – Atmos. deposition N ₂ O	252,414	189,752
<i>Waste applied to soil</i>		
Soil – direct N ₂ O	371,542	434,204
Soil – leaching & runoff N ₂ O	93,071	108,768
<i>Offsets</i>		
Total On-farm	9,024,554	7,068,834
Post-farm		
Pig freight	71,071	71,071
Meat processing	937,674	937,674
Exported manure		
Total Post-farm	1,008,745	1,008,745
Dressed weight sold - HSCW (kg/yr)	2,344,184	2,344,184
Carbon footprint	(kg CO₂-e / kg HSCW)	(kg CO₂-e / kg HSCW)
Pre-farm	0.8	0.90
On-farm	3.85	3.02
Post-farm	0.43	0.43
Total	5.18	4.35



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