PigGas Report 27 – 2,050 sow, outdoor bred, wean to finish on deep litter, multi-site piggery, WA.

February 2014

Production details

This piggery comprises two sites, an outdoor breeder site with weaners in deep litter sheds and a contract grow-out site where growers and finishers are in deep litter sheds. On the breeder site, gilts, dry sows and lactating sows are managed outdoors using a rotational paddock design utilising a weekly batch mating, farrowing and weaning system. Sows are mated and artificially inseminated in a specialised mating paddock, then placed in the gestation paddocks holding around 500 – 560 sows. Sows farrow in huts in groups of 10. Piglets are weaned at 24 days old into deep litter weaner shelters each housing 550 pigs. Weaner pigs are transferred at 11 weeks old to the contract grow-out site. The grower/finisher pigs are then housed in deep litter shelters each holding 275 pigs. The majority of pigs are sold at bacon weight at 105kg live weight. Depending on the seasonal reproductive performance at the outdoor unit, a proportion of pigs are sold as pork at 82 kg live weight to manage stocking densities at the grow-out unit.

Feed consumption

All feed is prepared off-site and delivered to both units. Total feed consumption is 8,549 t/yr.

Sales/Tranfers

Around 1,050 replacement gilts and boars are transferred to the outdoor breeder unit each year. Weaners transferred to the grow-out unit total 29,980 per year and may vary from a low of 400 per week during April to May to 700 per week during August to September, due to the variable seasonal reproductive performance at the outdoor unit. Total pork and bacon sales are 26,281 pigs/yr with a total dressed weight of 2,004 t/yr.

Waste management systems

Manure from the outdoor sows is directly deposited to soil. Spent litter from the weaners at the breeder unit is stockpiled, turned weekly and sold off-site as a mulch product. All spent litter from the shelters at the grow-out unit is stockpiled, conditioned and spread as fertiliser on cropping land on-site.

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Manure reuse systems

Sows are maintained in paddocks totalling about 130 hectares on a 366 hectare farm which includes cereal cropping as part of the paddock rotation-resting regime. The gestation and farrowing paddocks are rotated every 5 years and then either sown for wheat, barley or lupins by a neighbouring share-farmer. Spent litter from the weaner shelters on the breeder site is exported off-site and spent litter from the growers and finishers at the grow-out site is spread on a rotational basis on 1,200 hectares of cropping land on-site. The cereal straw from this cropping program is baled and used in the deep litter pig sheds.

On-Farm Baseline Emissions

The current baseline emissions from the outdoor breeder and grow-out sites is **934 and 1,493 t CO_2-e/yr** respectively, with an emissions intensity of **1.20 and 1.22 kg CO_2-e/kg HSCW**.

On-farm emissions for the whole piggery total **2,427 tonnes CO_2-e/yr** with an emissions intensity of **1.21 kg CO_2-e/kg HSCW**.

On-Farm Emissions Reduction Scenario

Being a combined outdoor and deep litter piggery, the emissions on this piggery are very low compared with conventional piggeries which emit high levels of methane from effluent ponds.

However, there are two possible options to reduce emissions, both through improved management. The first is to increase the number piglets weaned in the outdoor unit by 2% through improved management which will result in about 2% greater pig production. The second is to reduce feed wastage by 5% for growers and finishers in the deep litter unit.

This scenario (see table below) was modelled. It increased on-farm emissions slightly on the breeder site from **934 to 941 t CO_2-e/yr**, but reduced emissions intensity slightly from **1.20 to 1.19 kg CO_2-e/kg HSCW**. At the grow-out site, the scenario reduced emissions from **1,493 to 1,401 t CO_2-e/yr** and emissions intensity from **1.22 to1.12 kg CO_2-e/kg HSCW**. On-farm emissions for the whole piggery reduced from **2,427 t/yr to 2,342 t/yr** with emissions intensity reduced from **1.21 to 1.15 (5% reduction)**. Most of this reduction is due to reducing feed wastage.

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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	2,137,140	2,107,750
Milling & delivery	410,331	404,688
Pig freight	1,122	1,122
Straw & bedding	38,229	38,229
Total Pre-farm	***2,586,821***	***2,551,788***
On-farm		
Fuels & energy		
Purchased electricity	93,841	93,841
Fuel - stationary	111,122	111,122
Fuel - transport	0	0
Enteric CH_4	279,711	283,614
Manure management		
MMS CH_4	139,598	123,845
MMS – direct N_2O	979,552	933,778
MMS – Atmos. deposition N_2O	240,727	230,428
Waste applied to soil		
Soil – direct N_2O	465,811	452,397
Soil – leaching & runoff N_2O	116,686	113,325
Offsets	0	0
Total On-farm	***2,427,048***	***2,342,351***
Post-farm		
Pig freight	35,100	35,783
Meat processing	839,220	854,956
Exported manure	79,836	81,441
Total Post-farm	***954,156***	***972,180***
Dressed weight sold - HSCW (kg/yr)	**2,003,866**	**2,043,204**
Carbon footprint	**(kg CO_2-e / kg HSCW)**	**(kg CO_2-e / kg HSCW)**
Pre-farm	1.29	1.25
On-farm	**1.21**	**1.15**
Post-farm	0.48	0.48
Total	**2.98**	**2.87**

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