Improving performance of low wean weight pigs using nurse sows or starter nutrition

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Introduction

- Weaning weight (WW) is a critical factor in determining a pig's lifetime performance (Cole and Close, 2000)

- However, there are two main challenges to weaning weight:
  - Negative relationship of litter size to birth weight (BW)
  - Positive relationship between BW and WW

Are small pigs a problem?

- A low WW pig is defined as under 6kg at 28 days.
- A low WW pig is slower growing (Cole and Close, 2000)
  - Pressure on building occupation
  - More days = more feed and more slurry
- A low WW pig is less likely to make it to full slaughter weight (Boyd, 2012)
- A low WW pig may have poorer FCE (studies contradictory)
- A low WW pig has poorer meat quality(Gondret et al., 2006)

Aim of Study

- To improve whole life performance of low WW pigs using either:
  - A nurse sow
  - Or improved starter diet regime

Treatments

- Pigs (n=245) were allocated to five treatments:
  - **Low –Special + High**: low WW pigs (av. 5.2kg at 28d) weaned and offered a special starter diet followed by high starter diet allowances.
  - **Low – Nursed/High** and **Low – Nursed/Low**: low WW pigs (av. 4.9kg at 28d) were reared on a nurse sow until 49d after which they were offered either a high or low starter diet allowances;
  - **Normal/High** and **Normal/Low**: pigs (av. 8.9kg at 28d) were weaned and offered either a high or low starter diet allowances.

Diets

	Special	Starter 1	Starter 2
DE (MJ/kg)	18	16.5	16
CP (%)	20.75	22.5	22
Lysine (%)	1.75	1.7	1.6
Oil (%)	13.5	8.5	8.3
Allowances (kg/pig)			
Low – Special + High	1	4	8
Low – Nursed/High	-	4	8
Low – Nursed/Low	-	0	4
Normal/High	-	4	8
Normal/Low	-	0	4

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Materials and Methods

- Measurements:
  - Weight at Birth, 4, 7 and 10 weeks
  - Weekly feed intake
  - ADG and FCR were calculated
- Statistical analysis was carried out using REML Variance Component Analysis
  - Interactions between Nurse and Special runts
  - Interactions between High and Low starter allowances

Results: Live weight (kg)

	Low WW			Norm WW			Comparisons	
	Sp. + High	Nursed /High	Nursed /Low	High	Low	SED	Sp. V. Nurse	High V. Low
BW	1.15	1.07	1.11	1.52	1.39	0.060	0.197	0.267
4Wk	5.17	5.07	4.81	8.91	8.92	0.127	0.026	0.202
7Wk	12.0	10.8	10.3	17.6	14.7	0.405	<0.001	<0.001
10Wk	23.2	22.3	19.9	31.7	27.3	0.851	0.002	<0.001

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For the low WW pigs:

- Special + High had larger pigs at weaning than the Nursed pigs.
- By week 10 Special + High pigs were 2kg heavier than the Nursed treatments.

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- Pigs on High starter allowance were heavier from 7 weeks onwards compared to those on the Low starter allowance.

Results: Average Daily Gain (g/d)

	Low WW			Norm WW			Comparisons	
	Sp. + High	Nursed / High	Nursed / Low	High	Low	SED	Sp. V Nurse	High V Low
B-4wks	144	143	132	264	269	5.00	0.151	0.498
4-7wks	326	344	327	413	275	2.50	0.600	<0.001
7-10wks	536	603	543	670	601	2.10	0.147	0.006

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- No significant difference in ADG between Special + High and Nursed pigs

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- Pigs on High starter allowance had greater ADG from 7 weeks onwards compared to those on the Low starter allowance.

Results: Feed Intake and FCR

	Low WW			Norm WW			Comparisons	
	Sp. + High	Nursed / High	Nursed / Low	High	Low	SED	Sp. V Nurse	High V Low
ADFI (g/d)								
4-7wks	336	0	0	455	368	*	*	*
7-10wks	860	635	587	1,130	983	8.5	<0.001	<0.001
FCR								
4-7wks	1.18	NA	NA	1.15	1.44	*	*	*
7-10wks	1.71	1.14	1.20	1.71	1.71	0.12	<0.001	0.77

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- From 7-10wks, Special + High ate more than Nursed pigs;
- Nursed pigs had better FCR.

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- Pigs on High starter allowance had greater ADFI compared to those on the Low starter allowance with no effect on FCR.

Discussion

- **Low WW- Special + High pigs**:
  - heavier at 4, 7 and 10 weeks
  - cost an extra £1/pig

Normal WW pigs were >5kg heavier at 10 weeks than all the runt pigs treatments (up from 3kg heavier at weaning).

- **Low WW - Nursed pigs**:
  - better ADG (not Sig.) from 4-10 weeks
  - lower ADFI.
  - improved FCR.
  - cost an extra £4/pig

Discussion

- Pigs offered the high starter diet allowance performed better than the pigs offered the low starter diet allowance.
  - Normal pigs had poorer performance on low allowance(4.3kg diff.)
  - Nursed pigs being ‘older’ may have been able to tolerate a low starter diet allowance. (2.4kg diff.)

- This indicates that good starter diet regime is necessary for pig performance in the nursery.

Conclusion

- Low WW –Nursed/High and Low WW –Special + High had similar 10wk weights.

- Nursed pigs cost an extra £3 to rear.

- FCR of the Nursed pigs was better from 7 weeks of age which may improve whole life performance (results pending!)

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