Batch Farrowing Place

Cost investigation on pig farms – production changes

A major advantage of running the farm around the batch farrowing place is the ability to compare the cost of production systems. This paper looks at the simpler global models that can be developed. Later papers will examine cost control in more detail when individual parts of the farm are examined.
The basic model of 20 batch farrowing places will apply to all of the examinations. Readers are encouraged to examine their own farm capabilities.
Cost investigation
Using the BPEX 2009 Pig Yearbook Table B8 Summary of variable and fixed costs page 44 we are provided with cost analysis. How does this compare to our ideal farm?

BPEX 2009

Costs per pig - over 85 kg

Average weight sold (kg/lw)	99.3	kg
	£	%
Breeding stock replacement	0.96	1.01
Feed	55.72	58.45
Veterinary and medicine	2.11	2.21
Transport and marketing	2.12	2.22
Electricity and gas	2.17	2.28
Water	0.47	0.49
Straw and bedding	0.51	0.53
Other variable costs	9.94	10.43
Labour (inc family)	11.93	12.51
Building depreciation	1.07	1.12
Building repairs and maintenance	2.06	2.16
Equipment depreciation	0.34	0.36
Equipment repairs and maintence	1.99	2.09
Other fixed costs	3.94	4.13
Total costs	**95.33**	

While the costs are calculated on average live weight and farmers are actually paid on dead weight, the percentages would still remain the same.
Using our standard 20 batch farrowing place farm what are our targets using these costings.
The costs are resorted by percentage value – largest to smallest.
The actual farm costs for each of the categories can be inputted into the spreadsheet. A comment is provided based on how farm the actual costs vary from the target value either lower or higher.

Changes in the actual cost of component will be explored in the next paper.
This paper will look at a some production changes.

Failing to fill each farrowing place
The spreadsheet clearly demonstrates that failing to fill a farrowing place results in a loss of £400.
These are direct loss as this represents the cost of paying all the normal expenses which still happen if pigs were alive or not. The only real "saving" is the feed the pigs would have eaten. This is equivalent to increasing the cost of production by 3p kg dead weight on the rest of the batch.

Batch Farrowing Place - cost of changes in production

The yellow boxes can be customised. The other boxes are calculated within the spreadsheet

default 0 % actual variance

Comment Variance 2 %

Batch	1	week
Numbers bred	24	Females
Farrowing rate	84	%
Farrowing places	**20**	**sows**
Weaned per farrowing place	10	piglets
Weaning age	4	weeks
Post-weaning finishing rate	95	%
Pigs sold per year	9880	pigs
Live weight	100	kg
P2	11	mm
Killing out %	78	%
Dead weight	78	kg
Dead weight	765996	kg per year
Cost per kg deadweight	1.24	£
Total costs	948500	£
Income per kg deadweight	1.30	£
Total income	995795	£ per year
Profit	47295	£ per year

Cost analysis source: BPEX 2009

Annual Costs per pig - over 85 kg

Average weight sold (kg/lw) 99.3 kg

Our example farm

100 kg

	£	%	Target	Actual	Comment relative to industry
Feed	55.72	58.45	554394	554394	OK
Labour (inc family)	11.93	12.51	118699	118699	OK
Other variable costs	9.94	10.43	98899	98899	OK
Other fixed costs	3.94	4.13	39202	39202	OK
Electricity and gas	2.17	2.28	21591	21591	OK
Transport and marketing	2.12	2.22	21093	21093	OK
Veterinary and medicine	2.11	2.21	20994	20994	OK
Building repairs and maintenance	2.06	2.16	20496	20496	OK
Equipment repairs and maintence	1.99	2.09	19800	19800	OK
Building depreciation	1.07	1.12	10646	10646	OK
Breeding stock replacement	0.96	1.01	9552	9552	OK
Straw and bedding	0.51	0.53	5074	5074	OK
Water	0.47	0.49	4676	4676	OK
Equipment depreciation	0.34	0.36	3383	3383	OK
Total costs	**95.33**		**948500**	**948500**	OK
Cost per kg dead weight			**1.24**	**1.24**	OK
Non feed costs total per kg dead weight			**0.51**	**0.51**	OK
Income per kg dead weight			**1.30**	**1.30**	OK
Profit per kg dead weight			**0.06**	**0.06**	OK
Profit per year			**47295**	**47295**	OK

Impact of production change

This assumes that the cost of production per kg will stay the same for the new output

But to produce the extra or less production takes the same labour, equipment, medicine bills etc. as before

While this is not strictly correct, it provides a framework for analysis

New cost of production= $\dfrac{\text{Cost of production + (New fixed cost - Previous Fixed cost)}}{\text{New dead weight kg}}$

Missing a farrowing place

Rate of change 1 place

	17	18	19	20	
kg dead weight per batch	12482	13258	13955	14731	kg
Cost of production	15456	16416	17280	18240	£
"Extra" fixed costs	1157	758	399	0	£
New cost of production	16613	17174	17679	18240	£
Change in cost per kg	9.27	5.72	2.86	0.00	p
Profit per batch	-386	61	463	910	£

Change in farrowing rate -Note if you use higher rate it increases the chance of an empty farrowing place

Do not use farrowing rates above 86%

Rate of change 2 %

	Farrowing rate %							
	78	80	82	84	86	88	90	
kg dead weight per year	765996	765996	765996	765996	765996	765996	765996	kg

No impact on dead weight kg assuming pigs are bred to new farrowing rate

Other costs dependent on change in sow numbers only

Approximate sow herd size (not including gilts)	456	450	450	444	444	438	438	approx sow numbers
Extra feed required 1.1 tonnes/sow/year	33	16	16	0	0	-16	-16	tonnes
Sow feed costs 200 £ per tonne	6555	3278	3278	0	0	-3278	-3278	£
Change in the cost per kg dead weight	0.856	0.428	0.428	0.000	0.000	-0.428	-0.428	p
New profit	40740	44018	44018	47295	47295	50573	50573	£
Change in profit	-6555	-3278	-3278	0	0	3278	3278	£

Change in pigs weaned per farrowing place - of course we have to have space to accommodate the extra pigs

Rate of change 0.2 %

	Pigs weaned per farrowing place							
	9.4	9.6	9.8	10	10.2	10.4	10.6	
kg dead weight per year	720037	735357	750676	765996	781316	796636	811956	kg
Cost of production	891590	910560	929530	948500	967470	986440	1005410	£
"Extra" fixed costs	23646	15764	7882	0	-7882	-15764	-23646	£
New cost of production	915236	926324	937412	948500	959588	970676	981764	£
New cost per kg dead weight	3.284	2.144	1.050	0.000	-1.009	-1.979	-2.912	p
New profit	20811	29639	38467	47295	56123	64951	73779	£
Change in profit	-26484	-17656	-8828	0	8828	17656	26484	£

Change in post-weaning finishing rate

Unlikely that post-weaning finishing will be above 97%

Rate of change 1 %

	post-weaning finishing rate							
	92	93	94	95	96	97	98	
kg dead weight per year	741807	749870	757933	765996	774060	782123	790186	kg
Cost of production	918547	928531	938516	948500	958484	968468	978453	£
"Extra" fixed costs	12445	8297	4148	0	-4148	-8297	-12445	£
New cost of production	930993	936828	942664	948500	954336	960171	966007	£
New cost per kg dead weight	1.678	1.106	0.547	0.000	-0.536	-1.061	-1.575	p
New profit	33356	38003	42649	47295	51942	56588	61234	£
Change in profit	-13939	-9293	-4646	0	4646	9293	13939	£

Change in live weight kg

Pigs above 110kg need extra space requirements

Rate of change 5 kg

	85	90	95	100	105	110	115	
kg dead weight per year	639760	681394	723473	765996	808965	852377	896235	kg
Cost of production	792186	843740	895845	948500	1001705	1055462	1109768	£
"Extra" fixed costs	64949	43528	21878	0	-22107	-44443	-67008	£
New cost of production	857135	887268	917723	948500	979598	1011019	1042761	£
New cost per kg dead weight	10.152	6.388	3.024	0.000	-2.733	-5.214	-7.477	p
New profit	-25448	-1456	22791	47295	72056	97072	122344	£
Change in profit	-72743	-48752	-24504	0	24760	49776	75049	£

Impact of changes in production

Change in farrowing rate
A change in the farrowing rate produces only a small change in the cost of production because the only impact is in the feed eaten by the extra (or less) sows. On our example farm, if the farrowing rate fell by 4% (say in the summer) the cost of production increased less than 0.5p per kg. This would result in a loss of £4K.

Change in pigs weaned per farrowing place
Producing more pigs increases dead weight assuming the post-weaning finishing rate and dead weight is not affected and the farm has sufficient space in the nursery. However, an extra 0.2 pigs weaned reduced cost of production by 1p resulting in an increase in profit of £8K.

Change in post-weaning finishing rate – post-weaning mortality
A change in post-weaning mortality has a small change in cost of production. This assumes that the subclinical problems do not reduce dead weight. In addition, there is a significant difference in losing a 10 kg pig compared with a 100 kg pig. This spreadsheet does not account for the extra food eaten with stage of death – this will be examined in more detail in papers on the finishing herd production. However, assuming that the dead weight is the same – a 2% change in post-weaning mortality resulted in a 1p change in production of a loss of £9K profit.

Change in live weight kg sold
This has a direct impact on dead weight – the one production criteria we are paid for. Any increase in live weight while staying within the slaughterhouse matrix increases profit. A 5kg increase in live weight resulted in nearly £25K profit. But note, in the EU, if the live weight increases above 110kg there is a significant change in legal space required per pig from 0.65 m^2 to 1.00 m^2.

Comment
The use of spreadsheets based on batch farrowing places allows the farm to concentrate on areas which directly impact the profitability of the farm. This clearly demonstrates that effort in getting the right pig to market is more important than the farrowing rate or the number of sows.