Bench-marking Pig Production Breeding Herd Performance

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Abstract

Providing benching-marking advice to producers is an essential component to monitor performance against peers and to identify areas where production shortfalls occur. In this paper a number of important deficiencies in Western Australia pig production are highlighted. While several of these deficiencies are not necessarily additive, if all of the deficiencies were resolved it would reduce the cost of production of a finishing pig by $11.17 which if expressed as across Western Australia as a whole this would amount to $6.2 million a year.

Introduction

The basis of any herd examination is a determination of what is normal. Analysis of multiple farms within a similar climate zone allows for a blurring of the effect of stockmanship within the system revealing the underlying biology.

This paper uses the analysis of 15 farms, all based in Western Australia who used PigCHAMP to record their breeding herd performance. The farms are located between Perth and Albany. The farm data results were combined and the results analysed using the routine pig champ data base analysis capabilities.

The paper also describes the methodology used by consultants at Portec Australia to provide a baseline analysis for pig farm breeding herd analysis.

PigCHAMP is a pig recording system developed by the university of Minnesota in the 1980s. It is widely used as a DOS-based recording programme on pig farms.

The basic method of any investigation is to obtain targets and interference levels of acceptable production (Muirhead and Alexander 1996, Carr 1996). The farm performance can then be compared to these set targets. Suggestions for improvement in farm management can then be proposed to raise the farm's performance. The cost of the farm's suboptimal performance can be estimated. In this paper a fixed cost of $56 per finishing pig is utilised (Brennan and Nairn 2006).

Results and Discussion

The methodology utilised breaks the breeding herd performance into two sections:

a) Pig Flow – to indicate the farm's true potential
b) Reasons why the potential is missed

The reasons why the potential is missed can be subdivided into seven areas:

1. Variations in the farrowing rate
2. Seasonal variation on the farrowing rate
3. Breed to failed to farrow report
4. Wean to breeding interval on farm performance
5. Parity on farm performance
6. Repeat breeders and number of matings on the farm performance
7. Farrowing area

Pig Flow model for the combined 15 farms over 7298 females

Pig farms generally produce pigs year round, the majority using a once a week batching system. All of the 15 farms weaned weekly. Removing variation in the batch number of animals reared is an essential component of all-in/all-out production. This variation in numbers reared is controlled ultimately by the number of gilts bred in any one batch. The gilt pool is therefore at the beginning of the pig flow. At the beginning of any record analysis it is vital to compare performance with targets/bench-marks.

A population of 7,298 sows (table 1) and an expectation of 2.2 litters per sow per year produces a target of 309 sows per week/batch to be mated. Once the number of sows to farrow is ascertained, a target finishing herd output can be calculated. The number of sows to farrow is normally provided by the farmer and examination of the farm's special facilities. If 10 pigs were weaned per crate and a 3% post-weaning mortality was achieved with a dead weight of 70 kg (head off), a total of 10,810,172 kg of meat would be produced. The results from Western Australia indicate that a shortfall of 17,847 pigs produced an output of only 89% of target.

A financial estimate can be made using this performance. Fixed costs to produce 70 kg of meat is currently $56 per pig. Therefore, the fixed costs which were not covered by the shortfall of 17,847 result in an increase in costs of $999,432 or $7.24 per pig sold.

Table 1

GENERAL PERFORMANCE MONITOR

PigCHAMP 4.10

1 MAY 04 – 30 APR 05 © 1985,87,88,91,96 Univ of Minn

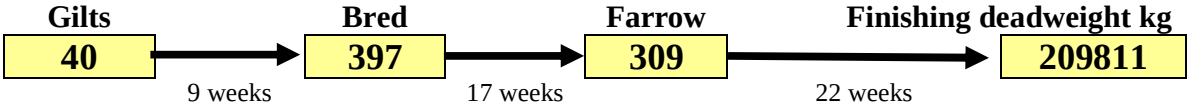
FARM: Western Australia Combined

	MAY 04 JUL 04	AUG 04 OCT 04	NOV 04 JAN 05	FEB 05 APR 05	MAY 04 APR 05	
BREEDING PERFORMANCE						
Total number of services	4757	4815	5020	4862	19454	
Percent repeat services	13.4	11.2	13.1	15.5	13.3	↑
Percent multiple matings	93.7	96.7	97.5	97.7	96.4	
Weaning – 1st service interval	6.0	5.9	5.8	6.1	5.9	Good
Percent sows bred by 7 days	85.2	87.1	92.4	89.4	88.6	OK
Entry – 1st service interval	40.3	23.2	39.0	44.5	36.7	
FARROWING PERFORMANCE						
Number of sows farrowed	3593	3929	4036	3968	15526	
Ave parity of farrowed sows	3.6	3.6	3.8	3.9	3.7	
Average total pigs per litter	**11.5**	**11.5**	**11.6**	**11.3**	**11.5**	↓↓
Average pigs born alive/litter	**10.5**	**10.6**	**10.6**	**10.4**	**10.5**	↓↓
Ave birth wt / liveborn pig	1.3	0.0	0.0	0.0	1.3	
Percent stillborn pigs	6.4	6.3	6.5	6.6	6.5	
Percent mummies	1.9	1.9	2.0	2.1	2.0	↑
Farrowing rate	**76.0**	**78.5**	**79.4**	**77.1**	**77.8**	↓
Adj. Farrowing rate	80.6	86.5	85.9	83.1	84.0	
Farrowing interval	147	148	146	145	147	
Litters / mated female / year	2.27	2.24	2.24	2.17	2.23	
Litters / crate / year	0.0	0.0	0.0	0.0	0.0	
WEANING PERFORMANCE						
Number of litters weaned	3517	3883	3988	4009	15397	
Total pigs weaned	32934	36459	38366	37517	**145276**	↓↓
Pigs weaned per sow	**9.3**	**9.4**	**9.6**	**9.4**	**9.4**	↓↓
Pre-weaning mortality	10.1	10.8	9.4	9.6	10.0	OK
Average piglet weaning weight	6.9	6.7	6.7	6.6	6.7	OK
Average age at weaning	21.6	20.8	20.1	19.9	20.6	
Adjusted 21 day litter weight	66	66	69	66	67	
Pigs wnd / mated female / yr	21.3	21.1	21.4	20.4	21.1	↓
Pigs weaned / crate / year	0.0	0.0	0.0	0.0	0.0	
Pigs weaned / lifetime female	30	36	32	31	32	
POPULATION						
Ending female inventory	6905	7056	7127	7298	7298	
Average parity	2.7	2.7	2.8	2.9	2.9	↓
Average female inventory	6873.5	6968.9	7212.6	7249.7	7074.7	
AFI / Crate	.	.	.	.	.	
Average gilt pool inventory	323.6	289.0	498.4	482.5	397.7	
Gilts entered	818	1008	1020	942	3788	
Sows and gilts culled	623	863	834	830	3150	
Sow and gilt deaths	117	127	152	171	567	
Ending boar inventory	251	249	213	229	229	
Sow – Boar Ratio	27.5	28.3	33.5	31.9	31.9	
Replacement rate	59.5	75.8	71.1	78.3	**71.2**	↑
Culling rate	36.0	49.1	45.9	47.0	44.5	
Death rate	6.8	7.2	**8.4**	**9.7**	**8.0**	↑
Ave non-productive sow days	71.8	71.3	80.8	87.4	77.9	
Ave NPD / parity record	26.9	23.8	27.6	28.9	26.8	

Parameters of concern are highlighted in red and **bold**. The arrows indicate the direction of concern

Table 2 **Proposed Pig Flow Model for the 15 combined farms 2004-2005**

Batch model:



Potential: **Based on the farrowing house potential output***

Parameters:

1	Batch time (weeks)
78	Recorded farrowing rate %
70	Expected average deadweight kg
3%	Post-weaning mortality

Annual targets and actual

Target Pigs sold	**155859**
Target weight paid for (kg)	**10910172**
Target numbers weaned	**160680**
Actual farm numbers weaned	145276
Actual farm numbers sold	138012
% potential achieved	**89 %**
Increase in costs (@$56 fixed cost per pig produced)	**$ 999,432**

*Other models could be devised around other restricting parameters – finishing space for example

Analysis of the farrowing rate report

Using the farrowing rate report in PigCHAMP the pig flow can be analysed in more detail. Set the examination date to the day after weaning. A Thursday weaning is normal for Western Australia, therefore, the records are examined from a Friday to a Thursday.

The last 40 weeks flow is used as a basis for analysis. This allows for at least 24 complete weeks of breeding to farrowing to be recorded. In this particular analysis the time frame was selected to provide for complete breeding to farrowing data in all 40 weeks, as reported in Table 2.

The farrowing rate achieved over the period is recorded at 78% (Table 3). If 309 sows are required to farrow each batch, a minimum of 397 females are required to be mated each batch.

Analysis reveals that the range of number of females (sows and gilts) bred per week ranged from 348 to 420. It is interesting that for 7,298 sows a breeding target of 397 is required and this target was only achieved seven times in the 40 week examination period. On many farms the breeding target is missed 50-60% of the time (Carr personal observation).

If the farm aimed to fill the farrowing area 90% of the time, a 90% percentile farrowing rate would be required. Using these records a minimum 73% farrowing rate would be set, resulting in a breeding target of 424 females per batch. This was not achieved at any time over the 40 week examination period.

The other significance of the variation in breeding numbers resulted in a variation in number of sows to farrow, between 238 and 333 a batch. At 10 piglets weaned per sow this is a difference of 1000 pigs weaned per batch. This unnecessary variation puts tremendous strain on finishing buildings and the slaughtering facilities in Western Australia.

Table 2

LAST 40 WEEKS FARROWING RATE REPORT

(Report generated to include all weeks to have finished farrowing)

PigCHAMP 4.10

26 JUL 04 – 1 MAY 05

FARM: Western Australia Combined

SERVICE DATES	S	LONG/ SHORT	L/S CUMUL	WEEK: SOWS PRESUMED PREGNANT 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16+	F	FARROW RATE	EXPECTED FARROW DATES
26JUL04- 1AUG04	348	348	348	348	345	341	331	318	311	308	307	305	303	303	302	302	300	297	273	273	78.4	18NOV04-24NOV04
2AUG04- 8AUG04	358	358	706	358	357	350	338	335	330	328	327	325	323	323	322	322	321	320	297	297	83.0	25NOV04- 1DEC04
9AUG04-15AUG04	361	361	1067	361	360	343	334	332	323	321	319	317	316	315	312	312	310	310	283	283	78.4	2DEC04- 8DEC04
16AUG04-22AUG04	378	378	1445	377	375	358	349	342	336	335	332	328	326	326	325	323	320	316	284	284	75.1	9DEC04-15DEC04
23AUG04-29AUG04	342	342	1787	342	339	330	316	315	310	307	303	300	299	298	297	297	296	293	264	264	77.2	16DEC04-22DEC04
30AUG04- 5SEP04	399	399	2186	399	397	388	379	373	370	365	363	357	357	357	357	355	355	351	315	315	78.9	23DEC04-29DEC04
6SEP04-12SEP04	415	415	2601	415	415	406	385	378	373	370	368	365	365	364	363	360	360	359	333	333	80.2	30DEC04- 5JAN05
13SEP04-19SEP04	353	353	2954	353	351	343	330	328	323	312	312	311	311	310	309	307	307	299	270	270	76.5	6JAN05-12JAN05
20SEP04-26SEP04	365	365	3319	365	364	350	338	333	327	319	317	316	311	310	310	310	309	309	279	279	76.4	13JAN05-19JAN05
27SEP04- 3OCT04	385	385	3704	385	384	369	353	345	341	335	333	331	331	331	329	328	326	322	294	294	76.4	20JAN05-26JAN05
4OCT04-10OCT04	362	362	4066	362	361	354	348	346	340	336	335	332	331	329	327	327	326	323	302	302	83.4	27JAN05- 2FEB05
11OCT04-17OCT04	351	351	4417	351	351	339	329	324	318	313	310	308	307	305	303	302	300	294	267	266	75.8	3FEB05- 9FEB05
18OCT04-24OCT04	373	373	4790	372	370	351	332	329	322	319	318	316	314	314	312	310	310	299	270	270	72.4	10FEB05-16FEB05
25OCT04-31OCT04	348	348	5138	340	340	331	315	307	301	298	298	297	296	296	295	294	292	291	271	271	77.9	17FEB05-23FEB05
1NOV04- 7NOV04	408	408	5546	399	399	390	370	359	352	346	343	339	339	338	337	337	336	335	317	317	77.7	24FEB05- 2MAR05
8NOV04-14NOV04	378	378	5924	377	375	364	344	342	330	326	323	320	318	316	316	316	314	313	283	283	74.9	3MAR05- 9MAR05
15NOV04-21NOV04	382	382	6306	379	377	365	340	336	325	320	317	317	315	315	313	312	311	307	275	275	72.0	10MAR05-16MAR05
22NOV04-28NOV04	383	383	6689	382	380	371	350	345	340	337	335	333	331	330	330	329	326	323	301	300	78.3	17MAR05-23MAR05
29NOV04- 5DEC04	381	381	7070	381	380	371	349	342	327	320	318	316	315	315	312	311	311	308	281	279	73.2	24MAR05-30MAR05
6DEC04-12DEC04	384	384	7454	383	381	376	352	333	325	318	314	313	313	312	312	309	308	306	285	285	74.2	31MAR05- 6APR05
13DEC04-19DEC04	366	366	7820	366	365	356	338	328	319	315	313	310	308	308	308	306	304	302	272	272	74.3	7APR05-13APR05
20DEC04-26DEC04	352	352	8172	352	351	347	325	316	313	306	302	298	297	295	294	294	293	293	272	272	77.3	14APR05-20APR05
27DEC04- 2JAN05	392	392	8564	392	389	383	362	358	354	347	343	339	337	332	331	331	330	330	293	292	74.5	21APR05-27APR05
3JAN05- 9JAN05	360	360	8924	360	360	349	341	332	327	320	318	316	314	313	310	309	306	305	286	286	79.4	28APR05- 4MAY05
10JAN05-16JAN05	359	359	9283	358	355	343	333	329	322	312	308	308	306	303	302	301	297	292	265	261	72.7	5MAY05-11MAY05
17JAN05-23JAN05	363	363	9646	359	357	341	322	315	306	302	301	300	300	300	299	297	296	292	269	268	73.8	12MAY05-18MAY05
24JAN05-30JAN05	388	388	10034	385	384	375	354	347	342	334	330	329	328	327	325	323	322	318	280	280	72.2	19MAY05-25MAY05
31JAN05- 6FEB05	377	377	10411	376	373	358	343	331	320	314	314	312	312	312	311	310	308	307	273	273	72.4	26MAY05- 1JUN05
7FEB05-13FEB05	364	364	10775	364	362	343	328	324	319	313	307	304	303	301	299	295	295	294	267	267	73.4	2JUN05- 8JUN05
14FEB05-20FEB05	386	386	11161	385	382	372	357	348	341	335	326	325	324	324	323	323	322	315	294	292	75.6	9JUN05-15JUN05
21FEB05-27FEB05	389	389	11550	389	385	370	337	330	324	317	315	313	312	312	312	309	307	305	269	258	66.3	16JUN05-22JUN05
28FEB05- 6MAR05	371	371	11921	370	366	354	339	333	319	315	313	308	303	303	301	301	299	295	254	249	67.1	23JUN05-29JUN05
7MAR05-13MAR05	349	349	12270	348	344	323	306	289	283	276	270	268	267	267	266	266	266	264	245	238	68.2	30JUN05- 6JUL05
14MAR05-20MAR05	420	420	12690	419	415	408	377	365	361	353	349	345	345	345	344	339	338	334	294	287	63.6	7JUL05-13JUL05
21MAR05-27MAR05	415	415	13105	413	411	397	360	353	344	336	336	333	330	329	326	326	324	320	292	290	68.3	14JUL05-20JUL05
28MAR05- 3APR05	366	366	13471	365	361	354	334	324	323	317	313	311	310	308	307	305	305	302	287	280	76.5	21JUL05-27JUL05
4APR05-10APR05	391	391	13862	391	390	378	357	346	337	332	327	326	322	320	320	320	318	315	306	300	76.7	28JUL05- 3AUG05
11APR05-17APR05	405	405	14267	405	405	398	375	368	357	351	349	346	345	344	343	342	340	338	329	328	81.0	4AUG05-10AUG05
18APR05-24APR05	410	410	14677	410	409	396	373	369	357	350	345	342	341	340	339	338	338	338	332	330	80.5	11AUG05-17AUG05
25APR05- 1MAY05	373	373	15050	373	370	356	338	328	315	312	306	304	300	298	297	297	297	296	294	290	77.7	18AUG05-24AUG05

8 sow(s) were served in the report period but were excluded from the report because they were transferred out of the herd before farrowing.

Impact of season on the farrowing rate

The data examination was extended to 2002 to 2004 to examine for the effects of season. The typical drop in farrowing rate associated with seasonal infertility was revealed, centered on matings in January, the summer months.

Table 3

The farrowing rate recorded per month by month bred

	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	
2002	80	77	74	72	69	73	78	79	79	80	81	79	%
2003	80	79	82	81	73	77	81	79	82	82	84	82	%
2004	82	83	82	75	75	77	77	77	79	79	80	79	%
Averages for the period 2002-2004													
	81	80	79	76	72	76	77	79	80	81	81	80	%

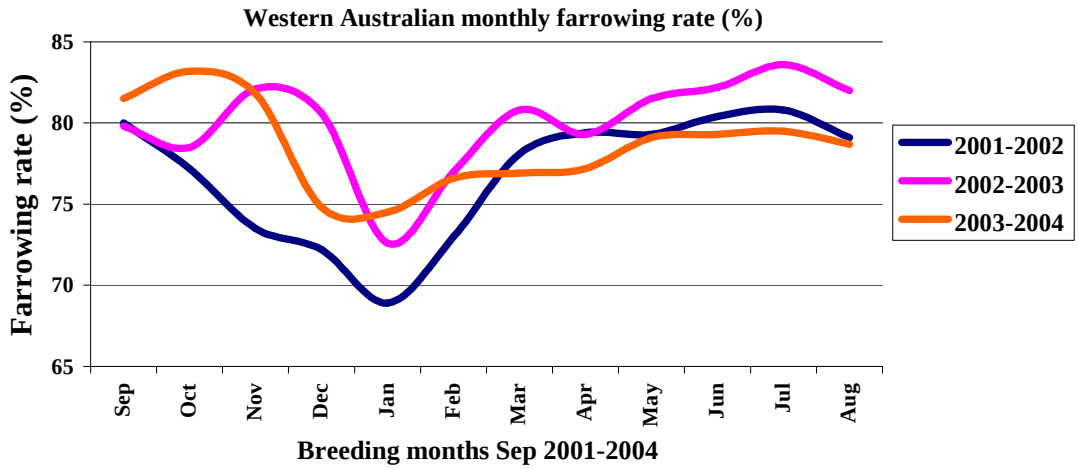


Figure 1. **Western Australian monthly farrowing rate**

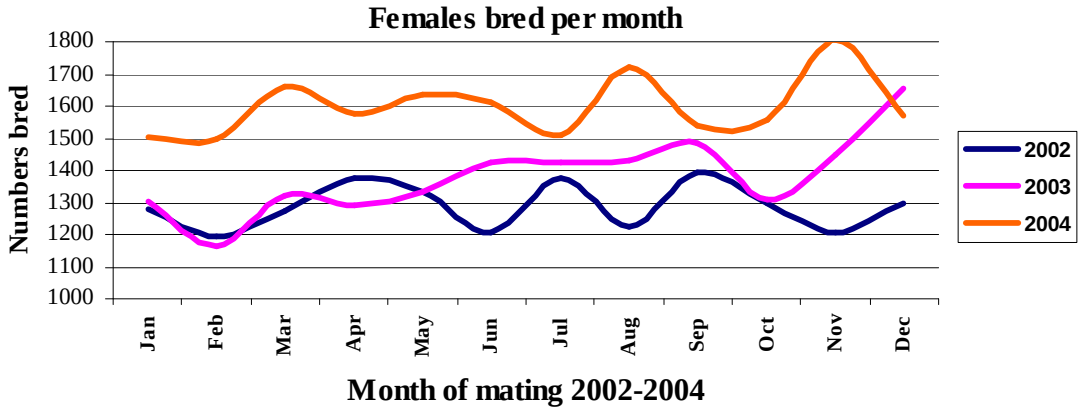


Figure 2. **Females bred per month**

While the number of females bred per month over the 15 farms has progressively increased with each consecutive year, of concern was that the producers of Western Australia did not change their number of females bred per month to compensate for the inevitable seasonal variations demonstrated in Figure 1. Figure 3 illustrates a summary of the seasonal variation in the farrowing rate and the number of animals bred per month.

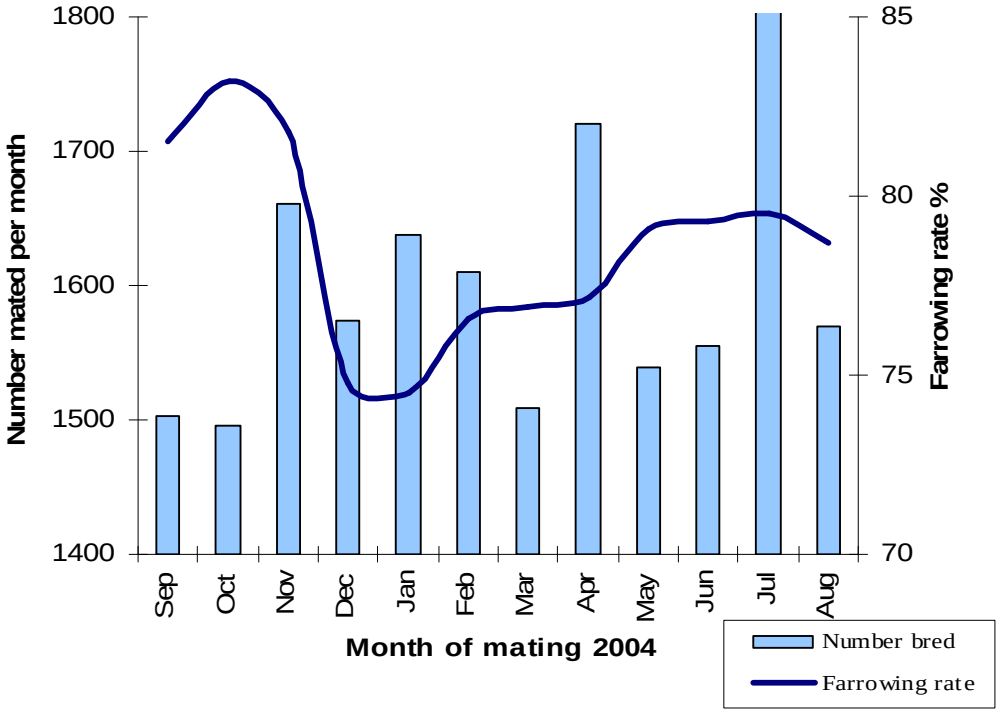


Figure 3. **Summary farrowing rate and number bred**

Analysis of bred but failure to farrow

Recorded breedings that failed to farrow

Interpretation of the data produces the graph shown in Figure 4.

The data can be broken down into time categories which represent important milestones in the pregnancy of the pig.

Regular returns

In the pig normal oestrus cycle every 21 days (range 18-24 days)

The data records a twin peak during the 18-24 days period with peak returns at 21 and 23 days. A target of 80% of all returns at 21-24 days should be set. The records indicate only 19% of non-pregnant females are identified during this critical first oestrus.

Irregular returns

All other dates when a female shows an oestrus are classified as irregular returns. Note this includes 36-48 days, which could be two normal oestrus periods.

If there is an implantation problem, resulting in a litter less than 4, the pregnancy will be terminated with a cyclic delay centered around 28 days (range 25–35) occurs – short pseudopregnancy.

Figure 4

Recorded breeding that fail to farrow
(Only includes sows that would have farrowed naturally)

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     FARROWDATE>1 MAY 04 AND FARROWDATE<1 MAY 05
SERVNOFARINT     COUNT    REL FREQ
ÄÄÄÄÄÄÄÄÄÄÄÄ    ÄÄÄÄÄÄÄ   ÄÄÄÄÄÄÄÄ
   0                3      0.1     ³Ü
   1               10      0.4     ³ÜÜÜ
   2                9      0.3     ³ÜÜÜ
   6                4      0.1     ³Ü
   9               13      0.5     ³ÜÜÜÜ
  10               14      0.5     ³ÜÜÜÜ
  11               10      0.4     ³ÜÜÜ
  13                8      0.3     ³ÜÜÜ
  14               21      0.8     ³ÜÜÜÜÜÜÜ
  15               20      0.7     ³ÜÜÜÜÜÜ
  17               22      0.8     ³ÜÜÜÜÜÜÜ
  19               36      1.3     ³ÜÜÜÜÜÜÜÜÜÜÜ
  20               81      3.0     ³ÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜ
  21              125      4.6     ³ÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜ
  22              114      4.2     ³ÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜ
  23              126      4.6     ³ÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜ
  24              105      3.8     ³ÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜ
  25               91      3.3     ³ÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜ
  26               86      3.1     ³ÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜ
  27               91      3.3     ³ÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜ
  28               72      2.6     ³ÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜ
  29               72      2.6     ³ÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜ
  30               58      2.1     ³ÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜ
  31               41      1.5     ³ÜÜÜÜÜÜÜÜÜÜÜÜÜ
  32               37      1.4     ³ÜÜÜÜÜÜÜÜÜÜÜÜ
  33               24      0.9     ³ÜÜÜÜÜÜÜÜ
  34               31      1.1     ³ÜÜÜÜÜÜÜÜÜÜ
  35               28      1.0     ³ÜÜÜÜÜÜÜÜÜ
  36               30      1.1     ³ÜÜÜÜÜÜÜÜÜÜ
  37               32      1.2     ³ÜÜÜÜÜÜÜÜÜÜ
  39               24      0.9     ³ÜÜÜÜÜÜÜÜ
  40               32      1.2     ³ÜÜÜÜÜÜÜÜÜÜ
  41               25      0.9     ³ÜÜÜÜÜÜÜÜ
  42               30      1.1     ³ÜÜÜÜÜÜÜÜÜÜ
  43               40      1.5     ³ÜÜÜÜÜÜÜÜÜÜÜÜÜ
  44               31      1.1     ³ÜÜÜÜÜÜÜÜÜÜ
  45               21      0.8     ³ÜÜÜÜÜÜÜ
  46               17      0.6     ³ÜÜÜÜÜ
  47               12      0.4     ³ÜÜÜÜ
  48               17      0.6     ³ÜÜÜÜÜ
  49               32      1.2     ³ÜÜÜÜÜÜÜÜÜÜ
  50               11      0.4     ³ÜÜÜ
  51               17      0.6     ³ÜÜÜÜÜ
  52               15      0.5     ³ÜÜÜÜÜ
  55               18      0.7     ³ÜÜÜÜÜÜ
  56               19      0.7     ³ÜÜÜÜÜÜ
  57               14      0.5     ³ÜÜÜÜ
  60               12      0.4     ³ÜÜÜÜ
  61                9      0.3     ³ÜÜÜ
  62               10      0.4     ³ÜÜÜ
  63               10      0.4     ³ÜÜÜ
  66                8      0.3     ³ÜÜÜ
  67                1      0.0     ³
  69                7      0.3     ³ÜÜ
  70               13      0.5     ³ÜÜÜÜ
  71                8      0.3     ³ÜÜÜ
  73                3      0.1     ³Ü
  75                2      0.1     ³Ü
  76                6      0.2     ³ÜÜ
  77               14      0.5     ³ÜÜÜÜ
  79               12      0.4     ³ÜÜÜÜ
  80                3      0.1     ³Ü
  82               11      0.4     ³ÜÜÜ
  83                6      0.2     ³ÜÜ
  84                8      0.3     ³ÜÜÜ
  88                2      0.1     ³Ü
  89                7      0.3     ³ÜÜ
  90                6      0.2     ³ÜÜ
  91               12      0.4     ³ÜÜÜÜ
  92                9      0.3     ³ÜÜÜ
  94                8      0.3     ³ÜÜÜ
  99               18      0.7     ³ÜÜÜÜÜÜ
 101               11      0.4     ³ÜÜÜ
 107               91      3.3     ³ÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜ
 108               86      3.1     ³ÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜ
 109               42      1.5     ³ÜÜÜÜÜÜÜÜÜÜÜÜÜ
 110               26      1.0     ³ÜÜÜÜÜÜÜÜ
 111               51      1.9     ³ÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜ
 112               50      1.8     ³ÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜ
 113               55      2.0     ³ÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜ
 114               49      1.8     ³ÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜ
 115               56      2.0     ³ÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜ
 116               26      1.0     ³ÜÜÜÜÜÜÜÜ
 118               19      0.7     ³ÜÜÜÜÜÜ
 120               12      0.4     ³ÜÜÜÜ
 121               28      1.0     ³ÜÜÜÜÜÜÜÜÜ
 122               24      0.9     ³ÜÜÜÜÜÜÜÜ
 123               20      0.7     ³ÜÜÜÜÜÜ
 125               10      0.4     ³ÜÜÜ
 126               22      0.8     ³ÜÜÜÜÜÜÜ
 128               21      0.8     ³ÜÜÜÜÜÜÜ
 131                6      0.2     ³ÜÜ
 133               10      0.4     ³ÜÜÜ
 136               12      0.4     ³ÜÜÜÜ
 146                5      0.2     ³ÜÜ
 147                4      0.1     ³Ü
 159                1      0.0     ³
 190                1      0.0     ³
 206                1      0.0     ³
 268                1      0.0     ³
```

LIST OVERFLOW: MORE THAN MAXIMUM OF 100 LEVELS

A small number of bred females are recorded as having a failure to farrow event between 0 and 17 days. Many of these bred females were probably not in heat at their first service date, thus accounting for their apparently aberrant cycle.

There is no specific peak recognizable at 28 days. The number of females found not in pig progressively drops until 33 days post-mating.

The period 36 to 48 days is classified as females which probably cycled between 18 and 24 days but were initially missed. This proposal is supported by the peak at 43 days.
After 48 days two further categories are arbitrarily used: 48-80 days, which include possible long pseudopregnancies (where implantation was successful but the fetuses died before day 35 – ossification of the foetus – oestrus delayed until a peak at 63 days post-mating), and multiple missed oestrus periods. Only a small proportion of returns (8%) fall into this category.

The largest proportions of females detected as not pregnant is found after 80 days. This includes abortions and multiple combinations of regular and late return animals.

The interval between breeding and detected are summarised in table 4.

Table 4

Summary of service and detected fail to farrow in day categories

Days post-breeding	**0-17**	**18-24**	**24-35**	**36-48**	**48-80**	**80+**
%target ideal	0	80	20	0	0	0
Farm actual	124	587	631	311	241	1265
% farm actual	**4 ↑**	**19 ↓↓**	20	**10 ↑**	**8 ↑**	**40 ↑↑↑**

Parameters of concern are highlighted in red and **bold**. The arrows indicate the direction of concern.

When the data is analysed using the producer's definition of reasons for return the data revealed table 5 and summarized in table 6.

Table 5

PigCHAMP report Farrowing rate - Detected Open Count and Percentage

FARROWING RATE REPORT — PigCHAMP 4.10
26 JUL 04 – 1 MAY 05 — © 1985,87,88,91,96 Univ of Minn
FARM: Western Australia Combined
Page: 3

	WEEK: SOWS PRESUMED PREGNANT																Avg
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16+	TOTAL	NPD
Detect Open, COUNT																		
Returned to estrus	4	**50**	380	621	192	222	172	68	57	40	14	25	18	21	**40**	**410**	2334	50
Preg. Check negative	0	0	0	0	8	10	0	2	2	1	0	0	0	2	0	1	26	48
Aborted	**1**	0	**2**	**4**	**15**	**14**	8	3	5	0	2	4	6	7	9	**31**	111	74
Not-in-pig	0	0	**12**	**15**	**7**	**1**	**3**	0	0	1	0	1	0	2	15	80	137	88
Culled, non-reproduc	**29**	**10**	**36**	**51**	**48**	**23**	**25**	**26**	**20**	**8**	**11**	**12**	**14**	**8**	**35**	**438**	794	88
Deaths	7	13	13	19	16	17	8	13	9	8	8	5	6	12	13	46	213	64
Culled, reproductive	0	1	1	0	0	1	1	1	1	0	2	1	1	0	1	7	18	87
TOTAL	41	74	444	710	286	288	217	113	94	58	37	48	45	52	113	1013	3633	62

	WEEK: SOWS PRESUMED PREGNANT																	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16+	TOTAL	NPD
Detect Open, PERCENT																	%	%
Returned to estrus	0	2	16	26	8	9	7	2	2	1	0	1	0	0	1	17	64.2	52.3
Preg. Check negative	0	0	0	0	30	38	0	7	7	3	0	0	0	7	0	3	0.7	0.6
Aborted	0	0	1	3	13	12	7	2	4	0	1	3	5	6	8	27	3.1	3.7
Not-in-pig	0	0	8	10	5	0	2	0	0	0	0	0	0	1	10	58	3.8	5.4
Culled, non-reproduc	3	1	4	6	6	2	3	3	2	1	1	1	1	1	4	55	21.9	31.3
Deaths	3	6	6	8	7	7	3	6	4	3	3	2	2	5	6	21	5.9	6.1
Culled, reproductive	0	5	5	0	0	5	5	5	5	0	11	5	5	0	5	38	0.5	0.7
TOTAL	1	2	12	19	7	7	5	3	2	1	1	1	1	1	3	27	100.0	100.0

Parameters of concern are highlighted in red and bold.

Table 6

Summary recorded reason for failure to farrow

Recorded reason for return	Record %	Target %
18-24 day return	**32 ↓↓**	60
Other returns (not N.I.P)	**32 ↑↑**	15
N.I.P	**4 ↑**	2
Abortion	3	6
Culls non-reproductive	**22 ↑↑↑**	6
Deaths	6	6

N.I.P. – pigs found not in pig coming up to farrowing.

Parameters of concern are highlighted in red and **bold**. The arrows indicate the direction of concern

Interpretation

The analysis of these figures suggests that there is a serious problem with heat detection and accurate pregnancy diagnosis. The number of pregnant sows being misdiagnosed until after day 80 of pregnancy needs urgent review. It is possible that abortions are not being recognised, but this is an unlikely. The females classified as abortions also cause concern as abortions are also recorded down to 3 weeks post-breeding.

The reasons for failure to farrow also show that the farms characterize failure to farrow as "culls non-reproductive". The records indicate that 55% of these culls occur in week 16 of 'pregnancy'.

The category "NIP" is reserved for pigs found "not in pig" coming into the farrowing area, and yet this category is used on sows in week 3-7.

There is also significant doubt on the accuracy of pregnancy diagnosis, as the farm records less than 1% of females detected open attributed to a pregnancy diagnosis.

Cost implication of failure to identify non-pregnant females
If non-productive sows of the 80+ days category were allocated each just 80 days, which were reduced to 21 days, with a cost of just $5.60 per non-productive sow day, a reduction of costs of $417,956 would be realised. If females in the 48-80 day category are allotted 55 non productive days and this is reduced to 21 days, it results in a reduction of costs of $45,886 and if the 36-48 category are allotted 42 non productive days, reduced to 21 days, this results in a reduction of costs of $36,573. A total reduction of costs of $500,415. The 7,298 sows produced 138,012 pigs sold, resulting in the saving of costs of $3.63 per pig sold. Over WA as a whole, this would equate to a saving of $1.9 million a year.

Analysis of the wean to breeding interval

The General Performance Monitor (Table 1) provides a baseline for the wean to breeding interval – it is recorded with an average over the year of 5.9 days, which is within the target interval of 4 to 7 days. The percentage of sows bred by 7 days at 89%, is however, below the target of 95%.

The wean to breeding interval is broken down on a daily basis in Figure 5. From this a summary can be made – Table 7.

Table 7 **Analysis of wean to breeding interval**

Wean to breeding days	Farm	%	Target %	Comment/Diagnosis
0-3	386	3	0	Early
4-7	11569	89	95	Ideal
8-21	**589 ↑↑**	**5 ↑↑**	0	Late or cycled in farrowing area
22-31	259	2	5	Possibly missed between initial 4-7 days
32+	**147 ↑**	**1 ↑**	0	Should consider culling

Parameters of concern are highlighted in red and **bold**. The arrows indicate the direction of concern

Interaction between events
Using database analysis capability, the impact of variation in one event can be assessed by its effect on other parameters.

Table 8 **Influence of the length of the wean to breeding interval and the subsequent pregnancy**

Wean to breeding interval days	0-3	4-7	8-14	14+
Farrowing rate %	**74 ↓**	77	**61 ↓↓**	**70 ↓**
Total born	12.1	11.6	**11.3 ↓**	11.7

Parameters of concern are highlighted in red and **bold**. The arrows indicate the direction of concern.

Figure 5

Weaning to service interval in days

Filter :
FARROWDATE>1 MAY 04 AND FARROWDATE<1 MAY 05

WEAN1STSERVINT	COUNT	REL FREQ
0	39	0.3
1	25	0.2
2	69	0.5
3	253	2.0
4	5642	43.6
5	4965	38.3
6	742	5.7
7	220	1.7
8	106	0.8
9	48	0.4
10	30	0.2
11	53	0.4
12	31	0.2
13	22	0.2
14	29	0.2
15	38	0.3
16	34	0.3
17	33	0.3
18	59	0.5
19	46	0.4
20	20	0.2
21	40	0.3
22	33	0.3
23	24	0.2
24	23	0.2
25	38	0.3
26	50	0.4
27	30	0.2
28	17	0.1
29	28	0.2
30	7	0.1
31	9	0.1
32	16	0.1
33	9	0.1
34	6	0.0
35	3	0.0
36	10	0.1
37	3	0.0
38	1	0.0
39	4	0.0
40	5	0.0
41	11	0.1
42	7	0.1
43	7	0.1
44	2	0.0
45	6	0.0
46	4	0.0
47	10	0.1
48	1	0.0
49	1	0.0
50	6	0.0
51	1	0.0
52	3	0.0
53	5	0.0
55	1	0.0
58	2	0.0
59	1	0.0
60	1	0.0
61	3	0.0
62	1	0.0
64	1	0.0
65	1	0.0
67	1	0.0
68	1	0.0
69	1	0.0
70	1	0.0
71	2	0.0
72	1	0.0
74	1	0.0
76	1	0.0
82	1	0.0
85	1	0.0
100	1	0.0
126	1	0.0
129	1	0.0
151	1	0.0
TOTAL	12950	100.0

Interpretation

The pattern of wean to breeding interval follows expected targets. However, there are too few sows cycling 4-7 days post-weaning when they are most productive. Note the 3% of sows, which are mated before day 4 post-weaning. Most significantly a large number of animals cycle between 8 and 21 days post-weaning when they demonstrate a reduction of 4% in the expected farrowing rate and 0.1 reduction in total litter size These have a significant impact on the productivity of the farm. However, note that delaying mating to day 15 post-weaning does not dramatically improve the productivity of the sows.

The interval from 8 days to 47 days post-weaning is detailed in Figure 6. Regarding pig biology the rise in number of sows which were detected at 26 and again 41 days post-weaning are possibly associated with sows which were initially missed between 4-7 days post-weaning and then had a normal cycle every 21 days later. The rise in cycling sows at day 18 post-weaning may be associated with animals that cycled at the end of lactation, prior to weaning. This may occur associated with partial weaning or poor lactation performance and feed intake.

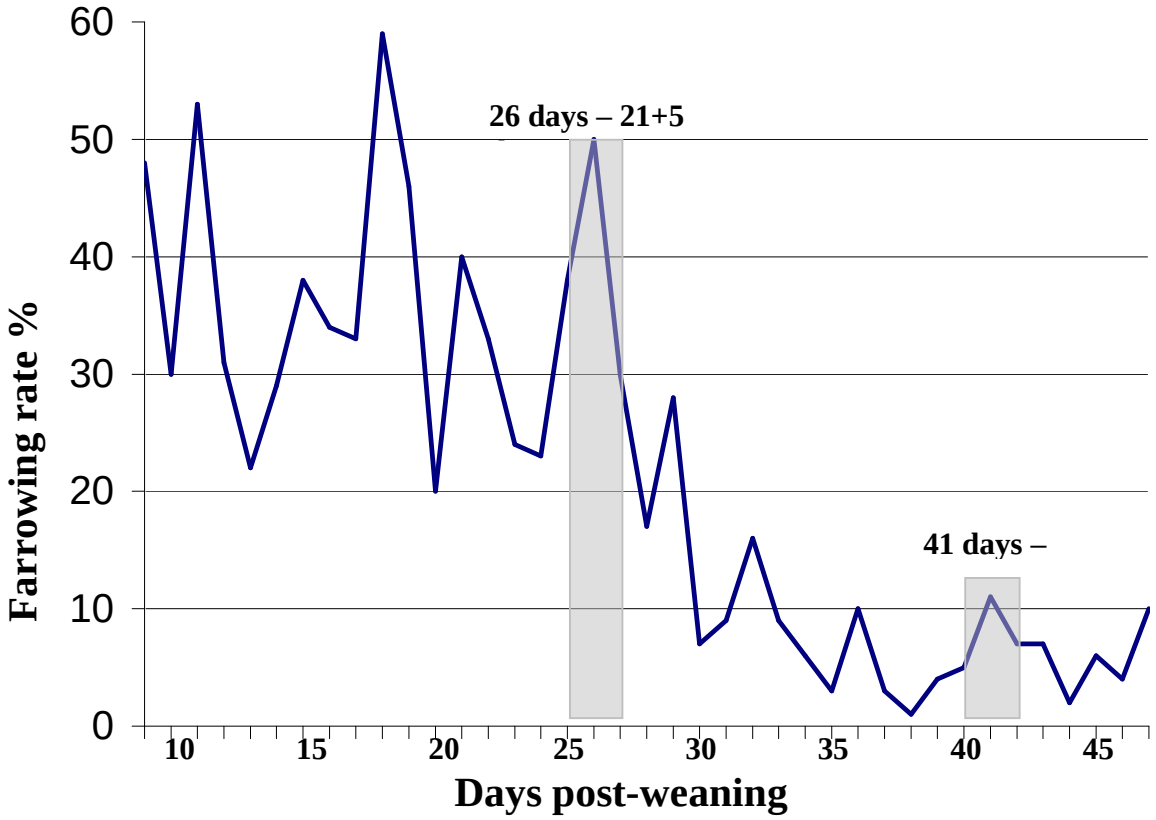

Figure 6 **Detail of the wean to breeding interval between 8-47 days post-weaning**

Effects of parity on breeding performance

The relative performance of each parity of pigs is revealed in the parity distribution report (Table 1). The data is summarised in Table 9.

Table 9 **Breakdown of the farm farrowing profile**

Parity	**0**	**1**	**2**	**3-6**	**7+**
Target %	17	15	14	46	8
Farm %	**25 ↑**	14	**11 ↓**	**42 ↓**	8

Parameters of concern are highlighted in red and **bold**. The arrows indicate the direction of concern

The parity profile suggests that too many gilts are brought onto the farms and fail to get to parity 3, when they are most productive. This pattern is indicated by the large 71% replacement rate.

The parity of the animals has a significant effect on the numbers of piglets produced by the farm as recorded in Table 10.

Table 10 **Interaction between the parity of the female and her breeding performance**

Parity / Total born	**1**	**2**	**3+**
Target	11.5	12.5	13
Farm	**10.7 ↓↓**	**11.1 ↓↓**	**12.0 ↓↓**

Parameters of concern are highlighted in red and **bold**. The arrows indicate the direction of concern

A major production parameter for clinicians to monitor is the performance of the 2nd litter. It is essential that the 2nd total litter size is larger than that achieved (on average) in the first litter. The figures indicate that the parity increase in litter size follows normal patterns. However, there is a rise of only 0.4 pig from gilt to 2nd parity (target 1 piglet) and an 0.9 pig increase from 2nd parity to the 3rd parity (target 0.5 piglets). Unfortunately, the gilt total litter size is 0.8 of a pig short of target.

Table 11

PARITY DISTRIBUTION REPORT

PigCHAMP 4.10
2 MAY 04 – 1 MAY 05
FARM: Western Australia Combined

	PARITY					ENTIRE
	0	1	2	3 – 6	7+	HERD
BREEDING PERFORMANCE						
Total number of services	4151	2866	2886	7982	1565	19450
Percent of services	21.3	14.7	14.8	41.0	8.0	100.0
Percent repeat services	18.9	14.9	12.8	10.4	11.1	13.3
Percent multiple matings	90.5	95.5	98.5	98.4	99.5	96.4
Weaning – 1st service interval	.	**7.0** ↑	5.7	5.8	5.4	5.9
Percent sows bred by 7 days	.	83.3	82.2	91.3	95.0	88.6
FARROWING PERFORMANCE						
Number of sows farrowed	0	3184	2445	7815	2089	15533
Percent of farrowings	.	20.5	15.7	50.3	13.4	100.0
Total pigs born alive	.	31739	25454	85428	20644	163265
Average total pigs per litter	.	**10.7** ↓	**11.1**	**12.0**	11.2	11.5
Average pigs born alive/litter	.	10.0	10.4	10.9	9.9	10.5
Average stillborn pigs	.	0.5	0.5	0.8	1.1	0.7
Percent stillborn pigs	.	5.0	4.9	6.6	9.6	6.5
Average mummies per litter	.	0.2	0.2	0.3	0.2	0.2
Percent mummies	.	1.6	1.8	2.1	2.1	2.0
Litters less than 7 born live	.	357	257	607	274	1495
Percent < 7 born live	.	**11.2**	10.5	7.8	13.1	9.6
Average litter birth weight	.	12.2	.	14.1	14.3	13.5
Farrowing rate	.	**73.4**	**79.0**	**79.9**	**76.0**	**77.8** ↓
Adj. Farrowing rate	.	77.5	83.5	86.5	86.4	84.0
Farrowing interval	.	.	152	146	144	147
WEANING PERFORMANCE						
Number of litters weaned	4	3135	2466	7751	2041	15397
Percent of weanings	0.0	20.4	16.0	50.3	13.3	100.0
Total pigs weaned	38	28287	23599	74465	18887	145276
Pigs weaned per sow	19.0	**9.0**	**9.6**	**9.6**	**9.2**	**9.4** ↓↓
Pre-weaning mortality	0.0	10.7	8.7	11.0	6.3	10.0
Net foster	38	234	183	-730	-91	-366
Average litter weaning weight	.	61.3	66.6	65.1	63.5	64.4
Average age at weaning	.	21.7	20.5	20.3	20.0	20.6
POPULATION						
Ending female inventory	1826	997	804	3078	602	7307
Percent of female inventory	**25.0**	**13.6**	**11.0**	**42.1** ↓	8.2	100.0
Females entered	3780	235	396	534	84	5029
Sows and gilts culled	394	316	338	1252	851	3151
Sow and gilt deaths	83	108	92	225	59	567
Average female inventory	1598.5	1128.5	1114.7	2846.7	568.7	7076.0
Percent of average inventory	22.6	15.9	15.8	40.2	8.0	100.0
Ave non-productive sow days	143.0	73.5	69.3	64.3	79.8	77.9
Ave NPD / parity record	60.5	24.2	27.2	21.9	20.9	26.8

Parameters of concern are highlighted in red and **bold**. The arrows indicate the direction of concern.

Effect of repeat breeders on breeding performance

Number of repeat oestrus cycles post-weaning

The farrowing rate falls precipitously with each repeat breeding post-weaning. The data from Western Australia follows the same expected trend.

Table 12 **Success of repeat breeding**

Repeat number post-weaning	Number of females	% of total matings	Farrowing rate%		Litter size – total born
			Farm actual	Target	
Post-weaning	16844	87	78	85	11.4
2	2286	12	**60 ↓↓**	75	11.3
3	305	2	**54 ↓↓↓**	50	**10.4 ↓↓**

Parameters of concern are highlighted in red and **bold**. The arrows indicate the direction of concern.

This summary indicates the futility of mating the 3rd repeat female where a farrowing rate of only 54% is recorded. Even the 2nd repeat female should be regarded with caution and only used to stablise pig flow, as her expected farrowing rate is only 60%. The fertility of the repeat breeders is also impaired with a reduction in total born. If $56 is used as the fixed cost associated with each finishing pig produced, mating a 2nd repeat increases these costs by $10.24 per finishing pig produced or total fixed costs of $66.24 per pig finished. The 3rd repeat increases these costs by $15.06 per pig produced or a fixed cost of $71.06 per pig finished. This impact on costs should be carefully considered before mating these sub-fertile animals. However, they can still be part of a pig flow calculation if their reproductive contribution is carefully taken into account. The loss of an empty farrowing crate's production results in $560 loss of fixed cost coverage.

Number of matings per breeding

The PigChamp data base provides a report which details the number of matings that are used at each breeding and the relative success of each system utilised.

Table 13

Matings per breeding Report

PigCHAMP 4.10
1 MAY 04 – 30 APR 05 © 1985,87,88,91,96 Univ of Minn
FARM: Western Australia Combined

TOTAL	ONE MATING	TWO MATINGS	THREE OR MORE
Number of services	704	10554	**8177**
Known service results	695	10069	7739
Returned to service	135	1771	912
Repeat service rate (%)	19.4	17.6	11.8
Number farrowed	488	7202	6223
Conception rate	78.3	79.0	85.6
Farrowing rate (%)	70.2	71.5	80.4
Adj. Farrowing rate	75.3	77.7	83.8
Ave. total born	10.7	11.3	11.4

Parameters of concern are highlighted in red and **bold**.

The data appears to indicate that 3 or more matings produce the best reproductive performance. Unfortunately, this table only represents the expectations from normal biology. In breeding females which have 3+ matings, the weaning to breeding interval is

shorter and they are naturally more fertile. If these females were only mated twice, the same results would be achieved. If a cost of $5 per mating was applied, the adoption of the third mating unnecessarily increased costs by $40,885 or $0.30 per pig finished. It is however, disappointing that 54% of sows mated had a farrowing rate of only 71% and this needs to be examined further.

Analysis of events in the farrowing area

Farrowing area

The success of breeding is achieved with the production of piglets. Total born is the gold standard. Table 1 is reviewed and summarised in Table 14.

Table 14 **Farrowing house performance**

	Total born	Born alive	Stillborn	Mummified	Weaned	Weight 24 days old
Farm actual	**11.5 ↓**	**10.5 ↓↓**	0.75	0.25 ↑	**9.4 ↓↓**	6.5 kg
Target	12.2	11.1	1.0	0.1	10	7.5 kg

Parameters of concern are highlighted in red and **bold**. The arrows indicate the direction of concern.

The total born alive is 0.6 pig below target. The stillborn rate is acceptable, however, the mummified number is high. Note however, that the combined stillborn and mummified rates would still be within accepted targets.

Total weaned per batch

The number weaned per sow is too low at 9.4; a target of 10 should be aimed for. The weights of the weaners were generally not recorded, but were recorded at 6.5 kg at 24 days. If the farms were able to wean 10 per crate, over the 15,397 weanings recorded, this would account for an additional 9,238 pigs weaned. With a 3% post-weaning mortality this would account for an additional 8,961 pigs finished. If there is a fixed cost of $56 per pig finished, this equates to a potential reduction in costs of $501,816 or $3.63 per pig currently finished annually.

Lactation length

The graph (Figure 7) indicates that the majority of the farms practise either 3- or 4-week weaning, with the majority of pigs weaned at 21 days of age. The range of lactation lengths is presented in Figure 7.

The impact of the lactation length on the subsequent reproductive parameters was assessed and summarized in Table 15

Table 15 **Interaction of lactation length on reproductive performance**

Lactation length	**0-11**	**12-17**	**18 +**	days
Wean to breeding	**10.5 ↑↑**	6.0	5.7	days
Farrowing rate %	**51 ↓↓↓**	**66 ↓↓**	77	%
Total born	**10.4 ↓↓**	11.4	11.6	piglets

Parameters of concern are highlighted in red and **bold**. The arrows indicate the direction of concern.

An increase in lactation length results in a reduction in wean to breeding interval and an associated increase in farrowing rate and litter size. The dramatic changes are associated with lactation lengths less than 11 days.

Figure 7

Lactation length results

Filter :
FARROWDATE>1 MAY 04 AND FARROWDATE<1 MAY 05

Lactation length days

	COUNT	REL FREQ	
0	53	0.3	³Ü
1	36	0.2	³Ü
2	23	0.1	³
3	23	0.1	³
4	21	0.1	³
5	15	0.1	³
6	25	0.2	³
7	24	0.2	³
8	26	0.2	³
9	39	0.3	³Ü
10	13	0.1	³
11	37	0.2	³Ü
12	60	0.4	³Ü
13	96	0.6	³ÜÜ
14	**388**	**2.5**	**³ÜÜÜÜÜÜÜ**
15	**972**	**6.3**	**³ÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜ**
16	**754**	**4.9**	**³ÜÜÜÜÜÜÜÜÜÜÜÜÜÜ**
17	**790**	**5.1**	**³ÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜ**
18	**1237**	**8.0**	**³ÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜ**
19	**1420**	**9.2**	**³ÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜ**
20	**1674**	**10.8**	**³ÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜ**
21	**2172**	**14.0**	**³ÜÜ**
22	**1723**	**11.1**	**³ÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜ**
23	**696**	**4.5**	**³ÜÜÜÜÜÜÜÜÜÜÜÜÜ**
24	**526**	**3.4**	**³ÜÜÜÜÜÜÜÜÜÜ**
25	**465**	**3.0**	**³ÜÜÜÜÜÜÜÜÜ**
26	**462**	**3.0**	**³ÜÜÜÜÜÜÜÜÜ**
27	**631**	**4.1**	**³ÜÜÜÜÜÜÜÜÜÜÜÜ**
28	**445**	**2.9**	**³ÜÜÜÜÜÜÜÜ**
29	187	1.2	³ÜÜÜ
30	123	0.8	³ÜÜ
31	53	0.3	³Ü
32	30	0.2	³Ü
33	27	0.2	³
34	27	0.2	³
35	28	0.2	³Ü
36	23	0.1	³
37	14	0.1	³
38	9	0.1	³
39	9	0.1	³
40	17	0.1	³
41	8	0.1	³
42	10	0.1	³
43	10	0.1	³
44	4	0.0	³
45	5	0.0	³
46	7	0.0	³
47	10	0.1	³
48	13	0.1	³
49	6	0.0	³
50	3	0.0	³
51	11	0.1	³
52	3	0.0	³
53	2	0.0	³
54	4	0.0	³
56	2	0.0	³
57	1	0.0	³
72	1	0.0	³
82	1	0.0	³
TOTAL	15494	100.0	

Summary

Providing benching-marking advice to producers is an essential component to monitor performance against peers and to identify areas where production shortfalls occur. In this paper a number of important deficiencies are highlighted. While several of these deficiencies are not necessarily additive, if all of the deficiencies were resolved it would reduce the cost of production of a finishing pig by $11.17 which if extrapolated across Western Australia as a whole is $6.2 million.

The results from Western Australia indicate that the pig flow only achieved 89% of its potential (based on 10 weaned per crate and a 3% post-weaning mortality). In terms of pigs, over the 7298 sows this resulted in a shortfall of 17,847 pigs produced, or 1,249,290kg deadweight. At a fixed cost of $56 per finishing pig, this resulted in a loss of cost coverage of $999,432 or $7.24 per pig sold. Over Western Australia (30,000 sows) this would account for a loss of approximately $4 million.

One of the causes of the missed opportunity was a general failure to set and breed sufficient females per batch. Analysis reveals that the range of number of females (sows and gilts) bred per week ranged from 348 to 420. For 7,298 sows achieving only 2.2 litter per sow per year, a farrowing target of 309 a batch (week) would be required. At the recorded 78% farrowing rate a breeding target of 397 per batch would be required. This was only achieved 7 times over the 40 week examination period.

Analysis of the reason for the 78% farrowing rate and the efficiency of detection of sows not pregnant revealed a serious problem with heat detection and accurate pregnancy diagnosis. The reasons for failure to farrow also shows that the farms misdiagnose failure to farrow as culls non-reproductive. Farms claim that sows are recorded pregnant at 24 days but fail to demonstrate a repeat oestrus, produce no abortive fetuses and are discovered not pregnant as they enter the pre-farrowing examination phase. An incredible 40% of sows are detected as not pregnant 80 days plus post-mating. If these non-pregnant females were detected earlier (at the first oestrus) it is estimated that a reduction of costs of $500,415 could be realised. The 7298 sows produced 138,012 pigs sold resulting in the saving of costs of $3.63 per pig sold. Over WA as a whole, this would equate to a saving of $2 million a year.

The parity profile demonstrates that too many gilts are brought onto farms and fail to get to parity 3, when they are most productive. This conclusion is also supported by the large 71% replacement rate. The parity profile disturbances contribute to the failure to wean sufficient piglets per crate. The parity results indicate a failure of litter size in the gilts, producing 0.7 pigs less than target. This failure is never recovered as the sow's age.

Analysis of the effectiveness of breeding sows which repeat is clearly shown by the results where a 3rd repeat only had a 54% farrowing rate producing 10.4 total born. Even 2nd repeat sows were significantly sub-fertile with a 60% farrowing rate although the litter size was only slightly reduced at 11.3.

Of some interest were the records for the number of matings per breeding. It was recorded that 42% of sows received three matings. While on paper this appeared to result in an improvement in farrowing rate and litter size. Unfortunately these results have more to do with normal pig biology than managerial enterprise. What is significant is that if a cost of $5 per mating was applied, the adoption of the third mating increased costs, over the 15 farms, by $40,885 or $0.30 per pig finished.

Analysis of the farrowing area reports the ultimate success of the breeding area. The records reveal that the total born at 11.5 is below a target of 12.2 by 0.7 piglets. Of more concern is that the number of piglets weaned at 9.4 is below a target of 10 weaned per crate. The effect of the lactation length in Western Australia was only significant below 12 days, when the farrowing rate generally collapsed to 51% together with a reduction in litter size to 10.4.

This paper illustrates the opportunity within the Western Australian pig industry where significant savings in the cost of production can be achieved by reviewing their production management in their breeding areas.