



UNIVERSITI PUTRA MALAYSIA

AN EVALUATION OF AN INTENSIVE PIG FARM

WASU KASIMANI

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BY

WASU KASIMANI

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An Evaluation Of An Intensive Pig Farm.

By: Wasu Kasimani

Supervised by: Dr. Chooi Kum Fai.

ABSTRACT

An evaluation study was carried out from 9th Nov,87 till 7th Dec,87 on an intensive 1800 sow piggery in Johor. Amongst the 3 units in this farm, the New Farm performed the best with an extraction rate of 175, average number of pigs weaned per litter 8.4, 20.2 pigs weaned per mated female per year and 10.4% preweaning mortality. The average age at weaning for the three unit is 27 days. For the entire farm, the average number of pigs weaned per sow per year was 17.4 and the extraction rate was 173. 18.3% of 1677 services on the farm (all units) were repeat services. The occurrence of repeat services was highest in Old Farm (22%). Other areas of suboptimal performance that were identified were, high preweaning mortality in Breeding Farm(15.9%) and under usage of boars in all three units. The estimated cost of producing an 80Kg porker from this farm is \$186.40 or \$2.33 perKg liveweight. Cost of boar service per litter produced was \$21.62. The optimum marketing weight for maximum profit calculated for the Singapore market, was found to be 90Kg. The extraction rate for all three units is 173 which indicates the farm is performing well.

Penilaian Sebuah Ladang Babi Intensif

Oleh Wasu Kasimani

Penyelia : Dr. Chooi Kum Fai

ABSTRAK

Penilaian ke atas sebuah ladang babi intensif di Johor telah di jalankan dari 9hb. Nov.,87 hingga 7hb. Dis.,87. Diladang ini terdapat tiga buah unit, diantaranya New Farm menunjukkan prestasi yang lebih baik dari segi kadar ekstrensi yang baik ia itu 175, bilangan anak babi yang diceraai susu dari satu litter ialah 8.4 dan 20.2 anak babi di ceraai susu daripada setiap babi baka betina setahun. Kadar kematian anak babi sebelum ceraai susu adalah 10.4%. Purata bilangan anak babi yang diceraai susu bagi setiap babi betina bagi satu tahun adalah 17.4 dan kadar ekstraksi adalah 173 bagi ketiga tiga unit. 18.3% daripada jumlah 1677 servis di ketiga-tiga unit kembali untuk di servis semula. Kadar servis semula yang tertinggi terdapat di Old Farm ia itu 22%. Prestasi suboptima yang dikenal pasti adalah kadar kematian anak babi sebelum ceraai susu yang tinggi terdapat di Breeding Farm ia itu 15.9% dan kadar kegunaan babi jantan bagi ketiga tiga unit adalah rendah. Anggaran kos untuk mengeluarkan seekor babi 80 kg adalah \$186.40 atau \$2.33 satu kg berat hidup. Kos babi jantan untuk mengeluarkan satu litter anak babi adalah \$21.62. Berat optima yang dapat pemulangan yang tinggi di pasaran Singapura adalah 90 kg. Pada amnya, ladang babi ini menunjukkan prestasi yang baik.

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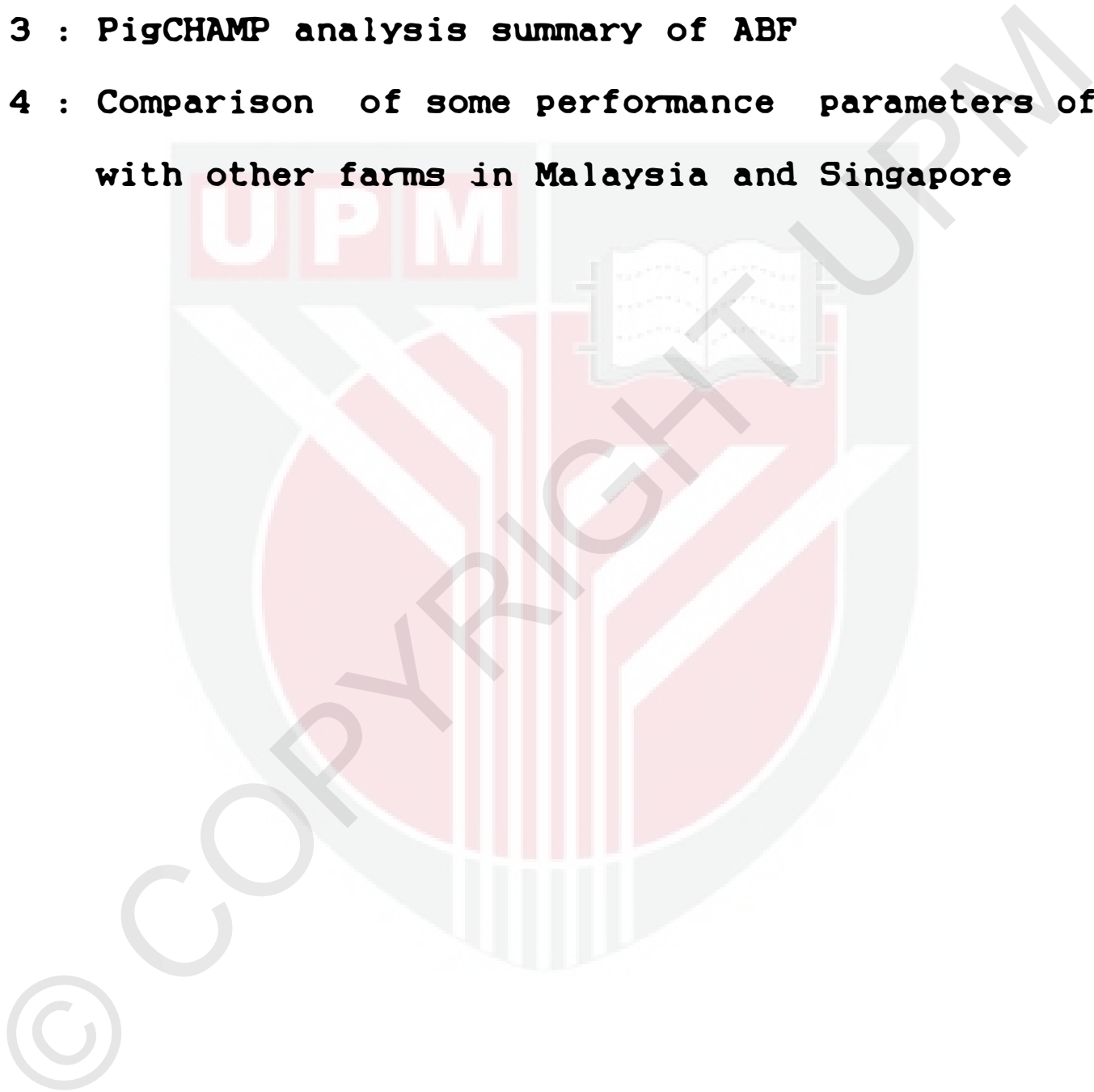
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Introduction

The Malaysian pig industry started as backyard farming and was based on swill feeding in the early 1900's. The pig farm in the late 1980's have developed into large scale modern commercial operations emphasising least cost, efficient management and husbandry systems.

The pig industry has developed sufficiently to be self supporting. It plays a major role in national development. Pig production valued at half a billion ringgit accounts for about 34% of the total livestock production in the country. It also provides employment for 30,000 workers and earned foreign exchange in excess of 20 million Ringgit in 1985. The industry also provides a ready and cheap source of protein. It is estimated that pork consumption will amount to 250,000 tonne by the year 2000, (Low Kan, 1987).

The trend of pig production in Malaysia is moving towards large scale modern intensive systems with overheads running into millions of dollars. Careful evaluation of such large pig operations is necessary to identify areas of suboptimal performance and rectify them for a better profit margin.

Thus, this study was carried out in a large commercial farm in Johor Bahru from 9th Nov.87 till 7th Dec.1987. The farm started as a 13-sow unit in 1970. Since then it has developed rapidly to a 1836-sow unit.

The objectives of my study are:

- a) To evaluate and compare the performance of the 3 units in the farm.
- b) To evaluate the farm (all units) in terms of
 - i) performance of sows
 - ii) boar usage
 - iii) performance of grower-finishers
- c) To estimate
 - i) cost of production
 - ii) cost of boar usage (per service)
 - iii) optimum market weight
- d) To compare some performance parameters of the farm with other farms in Malaysia and Singapore.

Literature review

Records provide a yard stick for evaluating the efficiency of production. By themselves, records do not improve litter size, average daily gain and piglets weaned per sow per year. However if properly kept and analysed, they indicate areas of deficiency that should be investigated and corrected. With the intensification of pig production an overall approach is needed. This involves proper recording, analysis and interpretation of data. (Pepper, et al.1977, Wrathrall 1977, Muirhead 1979, McDermitt 1982).

For a large commercial operation, a computer system utilising a suitable program would be the fastest and most efficient way to store, process and generate the necessary information. However, caution is needed when interpreting the data generated by the computer program (Pepper et al 1977, Pepper and Taylor, 1977). In the absence of clinical disease and where suboptimal productivity is the problem, productivity data and corresponding reference values are effective means for identifying problem areas (Muirhead, 1980)

Swine herd productivity is determined by factors such as sow prolificacy, feed efficiency, carcass quality and number of pigs marketed. When combined with the efficient use of physical resources, these variables largely determine profitability (Wilson, M.R., 1986). However, the only realistic way to analyse swine production is to consider the actual number of piglets weaned by a sow in a year (Anon, 1963, Wrathrall, 1977). A fertility index based on the average number of pigs weaned per year for each female in the breeding herd is often considered to be a more useful measure of reproduction (Blood and Radostits, 1985).

A commercial operation requires production targets. To avoid a sense of futility it is essential that targets set be realistic. For that purpose knowledge of local pig production parameters is useful (Wilson, M.R., 1986). There is shortage of published information on the level of productivity achieved by commercial herds in Malaysia (Tan, 1985). However, increasingly more information is being accumulated through animal industry projects of final year veterinary students of Universiti Pertanian Malaysia (Koh et al 1978, Chooi 1981, Morris 1982, Lau Sam 1982, Kok 1987).

Materials and Method

Records on the farm were computerized from 1st August, 1987. These records were analysed with the PigCHAMP software program developed by University of Minnesota.

The farm has 3 main units (Appendix A):

a) The Breeding Farm (BF) - 154 pure breed:
Landrace, Yorkshire and Durocs.

b) The New Farm (NF) - 1120 Landrace Yorkshire sows.

c) The Old Farm (OF) - 560 Landrace Yorkshire sows

There is a large feedmill which supplies the feed for all the 3 units.

Data from 1st August, 1987 till 30th November, 1987, were evaluated in this study.

1) Evaluation and comparison of performance of BF, NF and OF.

a) performance data for the three units were extracted from computers using PigCHAMP

b) analysis was done and data was compared with targets previously set by the farm

c) management and husbandry practice related to areas of suboptimal performance were noted down from actual observation and personal communication with staff.

2) Performance analysis of the farm.

a) data were extracted through PigCHAMP and analysed

i) sows breeding performance

farrowing performance

weaning performance

ii) boar usage

iii) grower - finisher

b) various management and husbandry techniques were observed in the light of suboptimal performance.

3. Estimation of

a) cost of production.

Calculations on cost of producing a 80 kg porker were done by analysing the sales record as well as various investment and operational costs. In this study only the NF unit was taken into consideration due to availability of accurate well kept information necessary for costing analysis.

b) cost of boar usage

Boar usage cards were analysed to determine the frequency of usage as well as its contribution to cost of producing a litter. Optimum marketing weight was also calculated based on relevant information obtained from the text books and the farm manager.

- 4) Results of various performance parameters obtained from the farm was compared with corresponding parameters obtained by various investigators in various parts of Malaysia and Singapore.



RESULTS

1. Performance comparison between BF, NF and OF. (Table 1)

The total number of services for the 3 units in the farm from 1st.Aug.,87 till 30th.Nov.,87 are ; BF :29, NF :1015, and OF :533. OF has the (highest percentage of repeat services that is 20.1%). The (average parity of sows is) 4.0 in BF, 4.6 in NF and 3.7 in OF. (Appendix B)

The (average number of pigs born alive per litter) in OF and NF is 9.3 whereas in BF it is only 8.6. 24.8% of the litters in BF has small litter size (less than 7 piglets per litter), as compared to 16.2 % in NF and 17.9 in OF. The (number of piglets weaned per litter,) for BF, OF and NF is 7.5, 8.3 and 8.4 respectively. (Pre weaning mortality) at BF is highest 15.9% and about 50% of the mortality was reportedly due to laid on. Average parity of sows culled for BF was 8.4 (Appendix C).

The (number of pigs weaned per mated female per year) in BF, OF and NF is 17.5, 19.3 and 20.2 respectively. BF has 1.9 litters per sow per year whereas OF and NF has 2.14 and 2.18 respectively. The number of (pigs weaned per sow per year is as follows: BF 14.5, NF : 18.1 and OF is 17.1. The extraction rate for NF is 175 and for OF is 171.

TABLE 1
TARGET AND PERFORMANCE SUMMARY OF ABF

	BF		NF		OF	
	TARGET PERFORMANCE		TARGET PERFORMANCE		TARGET PERFORMANCE	
REPEAT SERVICES %	15	19.4	15	17.2	15	20.1
WEANING TO SERVICE INTERVAL	10	8.8	10	11	10	9.7
FARROWING RATE %	85	80.6	85	82.8	85	79.9
FARROWING INTERVAL	155	159	155	155	155	158
NO. LIVE PIGLETS/LITTER	9	8.6	10	9.3	10	9.3
NO. WEANED PIGS/LITTER	8	7.5	9	8.4	9	8.3
PREWEANING MORTALITY %	10	15.9	10	9.3	10	8.9
LITTERS/MATED SOW/YEAR	2.3	2.1	2.3	2.23	2.3	2.22
NO. WEANED/MATED SOW/YEAR	18.4	17.5	20.7	20.20	20.7	19.30
PIGLETS WEANED/SOW/YEAR	16	14.5	18	18.10	18	17.10
EXTRACTION RATE /YEAR	160	NA*	180	175	180	171

*NOT AVAILABLE

2. Performance analysis (Table 2 and 3)

a) sow breeding performance

Total of 1677 services were recorded in all the 3 units from 1st. Aug.,1987 till 30th. Nov.,87 out of which 18.3 % are repeat services. Multiple matings are rarely done. The mean interval between weaning and first service is 10.4 days. 78.4% of sows are bred by 7 days after weaning.

Total number of farrowings for the period is 1323. Average pig per litter is 9.9 and average pigs born alive per litter is 9.3. The average farrowing interval is 153 days.

Total number of litters weaned for the period is 1287. Average preweaning mortality is 10.4% of which 5.2% was due to laid on. Average number of piglets weaned per litter was 8.3. Average age at weaning was 26.1 days. Average number of pigs weaned per mated female per year was 19.5 but average number of pigs weaned per female per year is 17.4.

b. Boar usage.

Boars in all the unit are under used. The boar sow ratio is 1 : 18. Only 20 % of the boars are mated more than 100 times per year. Only one boar in BF is used for mating more than 50 times in a year. Generally all the boars have about 80 % conception rate (Appendix G).

c. grower finisher performance

The average age for marketing ranges from 165 to 180 days. 29850 porkers were sold from December, 86 till November, 87. The post weaning mortality is less than 2 %. Most of the post weaning deaths were due to diarrhoea, dehydration and general debility. The extraction rate* is 173. Porkers sold to Johor Bahru usually weighs in the region of 75 kg but those to Singapore are about 80 kg.

$$* \text{ extraction rate} = \frac{\text{No. of porkers sold}}{\text{Standing sow population}}$$

Table 2

PIG CHAMP ANALYSIS OF ABF (3 UNITS) FROM 1 AUG.87-30 NOV.87.

Breeding Performance

1. Total no. of Services	1677.0
2. % Repeat Services	18.3
3. Weaning-First Service Interval	10.4

Farrowing Performance

1. No. of Sows Farrowed	1323.0
2. Av. Total Pigs/Litter	9.9
3. Av. Pigs Alive/Litter	9.3
4. Farrowing Interval	156.0
5. Litters/Mated Sow/Year	2.22

Weaning Performance

1. Pigs Weaned/Litter	8.3
2. Prewean. Mortality	10.4
3. Av. Age At Weaning	26.1
4. Pigs Weaned/Female/Year	17.42

Population

1. Ending Sow Inventory	1832.0
2. Ending Boar Inventory	100.0

Table 3

PIG CHAMP ANALYSIS OF ABF (3 UNITS) FROM 1 AUG.87-30 NOV 87.**B) Boars Usage**

1) Boar to Sow Ratio	1:18
2) % Boars Used More Than 100 Times/year	20.0
3) Estimated Conception Rate (%)	80.0

C) Grower to Finisher

1) Marketing Age(days)	165 to 180
2) Total Porkers Sold(1 year) (Dec.86 till Nov.87)	29850.0
3) Post Weaning Mortality(%)	1.8
4) Extraction Rate	173.0

$$\text{Extraction Rate} = \frac{\text{No. of Porkers Sold}}{\text{Standing Sow Population}}$$

5) Marketing Weight(Kg)	75 to 80
-------------------------	----------

3. a) Estimated cost of production per porker

The cost of producing one porker at 80Kg is \$186.48, and the average cost per live weight is \$2.33. The calculation is as follows:

Fixed Capital

Buildings

Trucks

\$2,500,000.00

Feedmill and Silos

Machineries

Breeding Stock

Raw Materials

\$ 500,000.00

Working Capital

Total Capital Invested**\$3,000,000.00****Operating Costs**

Labour

\$ 160,000.00

Veterinary Fees and Medicines

\$ 45,000.00

Maintenance Charges

\$ 120,000.00

Feed Costs (Appendix H)

\$2,551,886.00

Misc. Costs and Tax

\$ 60,000.00

Servicing of Loan

\$ 500,000.00

Depreciation of Fixed Capital 5%
(Linear Method)

\$ 125,000.00

Total Operating Costs**\$3,561,886.00**

Total number of porkers produced from NF for a period of one year- 19100 heads.(Dec.86 till Nov.87)

Cost of producing one porker at 80Kg is \$3,561,886.00 divided by 19100 which is \$186.48.



3.b) Estimated Costings Of Boar Service In ABF

Assumptions

- A) Boars bought at six months of age at @ \$1,200.00
- B) Boars serviced average 18 breeding females for a period of 42 months,producing about 140 litters.(Estimated Farrowing Index 2.2).
- C) Average cull value of boar is \$100.00.
- D) Boars are mated only once per estrus.

Cost Of Maintaining A Boar For 42 Months

A) Feeding @ 2.5Kg/day x 0.45 cents/Kg 1278 Days x 2.5Kg x 0.45 cents	\$1437.75
B) Labour \$6.00/boar/month	\$ 252.00
C) Eggs and drugs given	\$ 50.00
D) Maintainence and miscellaneous costs	\$ 50.00
E) Depreciation of housing and machineries 5% (average costs of pen for boar at NF is \$300.00) .	\$ 53.00
F) Mortality at 2%	\$ 84.00
G) Boar replacement	\$1200.00
Total Costs	\$3126.75
Subtract the cull value of the boar	\$ 100.00

\$3026.75

Costs of boar service per litter- \$3026.5 divided by 140
= \$21.62.

4. Comparison of some performance parameters with other farms in Malaysia and Singapore.

Table 4 , shows the findings of other workers in various parts of Malaysia and Singapore. Some of the important parameters are a. piglets per litter b. litters per sow per year c. weaners per sow per year d. extraction rate. From the table 4 , it suggests that performance of ABF is comparable or better than some of the farms surveyed in Malaysia and Singapore.

Table 4

COMPARISON OF SOME PERFORMANCE PARAMETERS OF ABF
WITH OTHER FARMS IN MALAYSIA.

Source	Wasu	Khoo	Chooi	Morris	Kok	Kuan	Koh et al	Lau Sar	
Perfore. Year	87	86	81	82	86	78	78	82	
Parameters Location	JB	S'pore	T.Merah	S'mak		Pucong	Rawang	Sg.Buloh	
Farrowing Interval (days)	156	NA	154±18	167±24	167	NA	NA	NA	
Litter Size At Farrowing	9.6	Max 9-10.5	Min 7-8	10.4±1.2	9.13±2.28	9.1	9.5±0.91	10.7±1.6	9.6
Age At Weaning (days)	26.1	29-40	21-26	31	28.39±4.92	29.91	35	20.5±1.4	21-28
Piglets Per Litter (weaned)	8.3	8-9	6-7	7.68	7.84±2	8.7	9.13	9.1±1.2	7.9±1.5
Litters/Scw/Year	2.16	NA		2.06	2.19±0.31	NA	NA	NA	NA
Weaners/sow/year	17.4	NA		15.82	17.59±5.93	NA	NA	NA	NA
Extraction rate	173	NA		NA	NA	NA	NA	NA	NA
Weaning to 1st service Interval (days)	10.4	9-21	4-7	NA	17.6±16.45	15.7	NA	NA	8
Preweaning Mortality (%)	10.4	12.5-29	3-10	26.45	21.05	14.1	3.89	14.59	NA

1 NA--- Not Available

DISCUSSION AND RECOMMENDATION

1. Performance comparison of BF, NF and OF.

NF generally performed better in terms of extraction rate and number of piglets weaned/sow/year than OF and BF because of:

- a) better location on a hill with (adequate ventilation and good housing design.)
- b) (well planned buildings and good sanitary measures.)
- c) (well designed flooring system and facilities).
- d) (efficient utilization of labour.)

BF shows poorer farrowing and weaning performance (Appendix C) as expected compared to OF and NF. This could be because breeding animals in BF were pure bred whereas breeding stock in OF and NF were cross bred. (Kuan and Mak, 1978).

There was high incidence of preweaning mortalities in BF in the month of September and October, 22.4% and 17.8% respectively. This was due to the presence of old sows of more than 10 parities. Tubbs R.C. 1987, reported that weak pigs are associated with large litters and older sows. Large litters(over 12) are associated with undersized piglets, which are weak and

are more susceptible to crushing and starvation than heavier pigs (English and Smith 1975). My recommendation is to cull old unproductive sows at 8-10th or earlier based on parity distribution report when the litter size and weight declines.

2. Performance analysis for all the 3 units and costings:

- a) About 20% of the sows mated comes into repeat service; in some months it exceeds to 25%. Muirhead 1976, states that interference level is 12% (Appendix K). High return rates in the herd could be attributed to a combination of boar underuse and the practise of single mating (Kok 1987). Repeat breeding if it occurs at regular intervals, indicates conception failure, at irregular intervals it indicates early embryonic death, hormonal problems or heat detection problem, (Tubbs R.C., 1987). To overcome this problem, my recommendations are ;
 - i) mate at least twice per estrus
 - ii) heat detection should be done twice per day
 - iii) boars should be used at least 3-4 times per week or two sows per week
 - iv) 'run down' effect of 1st parity sows should be monitored.

b) In all the 3 units the sow boar ratio is about 1:18; since boars are used only once per estrus, they are underused. Leman and Rodeffer 1976, reported that the number of boars needed is equal to the maximum number of females on heat per day x 2. Double matings can significantly increase conception rate and subsequent litter size (Blood and Radostits, 1985). The return to service rate of single mated sows is consistently higher than that of double mated sows, (Kok, 1987). A reasonable expectation of work from a male might be 200-300 matings yearly; or 2 females weekly, each of which might be mated 2 or 3 times, (Whittemore C.T, 1980). Based on boar usage costings calculation on page 13, if the boars are used for 2 females weekly with 2 matings each estrus period, average number of litter produced will increase from 140 to 165. This mean cost of boar service per litter now will be \$18.34; saving \$3.30 per litter. Average number of farrowings in ABF per month is 320, which means (320 @ \$3.30) \$1056.00 can be saved each month or \$12,288.00 per year. As stated by Blood and Radostits, 1985, the litter size will also increase due to double matings per estrus which means more piglets and a wider profit margin.

c) According to Whittemore, 1980, the best profit margin per pig is achieved at a slaughter weight of 115 kg, whilst the best margin per pig per place per year occurs at the slaughter weight of 95 kg. However, in the Singapore market, flat rate payments are given for pigs 95 kg and below. Thus the weight of porkers marketed should be increased from 80 to 90 kg. With reference to Appendix I, even at \$500.00 per tonne of feed and 3.6 FCR, the feed cost per kg live weight gain is \$1.80 whereas the porker price in Singapore averages \$2.50 per kg or more. So there is an increase of \$0.70 for every kg of live weight increase, which means at 10 kg increase (80 kg to 90 kg) would result in \$7.00 increase per porker. Subtracting the labour and other miscellaneous costs, there would be a net increment of \$5.00 per porker. If 2000 porkers from ABF are sold to Singapore each month, an additional income of \$10,000.00 will be obtained. This higher level of feeding will primarily depend on a) flat rate payments of porker
 b) raw material costs c) market price of porkers.

3. Comparison of some performance parameters with other farms in Malaysia and Singapore.

The extraction rate, number of piglets weaned per sow per year, farrowing interval and farrowing index of the farm are superior to figures obtained by other investigators in Malaysia. This may be due to better housing, management, and breeding practices of the farm. The extraction rate is 173 compared to national average of 160 by Mustafa babjee et al, 1982. The average cost per kg liveweight of porker produced is cheaper by \$0.32 than that calculated by Mustafa babjee, et al, 1982.

4. Other recommendations.

At least 5 of the ponds which supply water to the farm could be reared with fresh water fishes to increase the gross income of the farm.

CONCLUSION

The farm has come a long way, from a small 13- sow farm with poor housing design, performance, management and husbandry techniques into a large intensive high producing modern pig farm, with the vision to increase its sows population, production efficiency and porker quality. This is evident with the importation of breeding stock , building of large well planned pig unit and feed mill, computerization of production data, weekly evaluation of performance data from PigCHAMP , introduction of better identification system for porkers and acquired porker market in Singapore. Therefore, I can conclude that the farm is good, progressive and well performing.

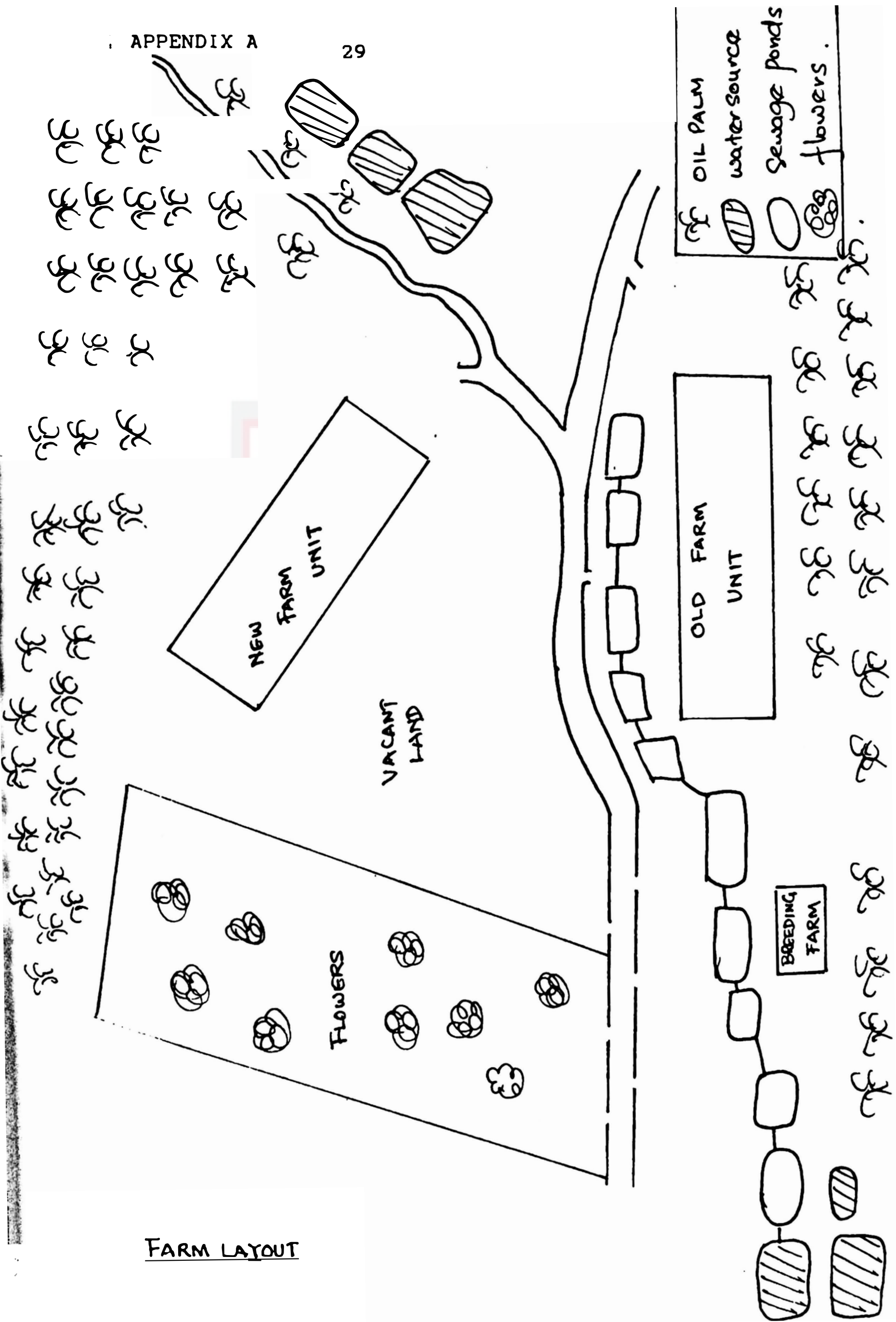
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FARM LAYOUT

APPENDIX B

FARM COMPARISON
1 DEC 86 - 30 NOV 87

FigCHAMF 1.3
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	BF	NF	OF	TOTAL
BREEDING PERFORMANCE				
Total number of services	365	2659	1344	4368
Number 1st services	337	2472	1234	4043
Number repeat services	28	187	110	325
Percent repeat services	7.7	7.0	8.2	7.4
Percent multiple matings	24.7	1.1	0.7	3.0
Weaning - 1st service interval	13.1	12.3	13.6	12.7
Percent sows bred by 7 days	73.3	77.4	71.8	75.4
Entry - 1st service interval	1	6	3	5
FARROWING PERFORMANCE				
Number of sows farrowed	307	2232	1080	3619
Ave parity of farrowed sows	5.9	5.2	4.6	5.1
Total pigs born alive	2869	22205	10554	35628
Average total pigs per litter	10.0	10.5	10.0	10.3
Average pigs born alive/litter	9.3	9.9	9.8	9.8
Average pigs born dead/litter	0.6	0.6	0.2	0.5
Percent born dead	6.1	5.6	2.4	4.7
Percent mummies	0.0	0.0	0.0	0.0
Litters less than 7 born live	40	173	106	319
Percent < 7 born live	13.0	7.8	9.8	8.8
Average birth weight				
Farrowing rate	93.0	96.6	95.2	95.9
Average gestation length	115	114	115	115
Farrowing interval	159	156	157	157
Litters / mated female / year	2.42	2.47	2.57	2.50
WEANING PERFORMANCE				
Number of litters weaned	293	2169	1015	3477
Total pigs weaned	2360	19346	8835	30541
Pigs weaned per litter	8.1	8.9	8.7	8.8
Pigs weaned per sow farrowed	7.7	8.7	8.2	8.4
Pre-weaning mortality	15.9	10.0	10.9	10.7
Average weaning weight				
Average age at weaning	26.9	26.8	26.5	26.7
Average Ohio SFI				
Pigs weaned/mated female/year	19.2	21.9	22.0	21.7
POPULATION				
Ending female inventory	169	1100	564	1833
Average parity	4.0	4.6	3.7	4.3
Average female inventory	142.3	995.5	490.8	1628.6
Gilts entered	83	361	277	721
Replacement rate	58.3	36.3	56.4	44.3
Sows and gilts culled	28	94	78	200
Culling rate	19.7	9.4	15.9	12.3
Ave parity of culled sows	8.4	6.3	5.7	6.4
Sow and gilt deaths	0	0	0	0
Death rate	0.0	0.0	0.0	0.0
Ending boar inventory	27	61	27	115

APPENDIX C

PERFORMANCE MONITOR
1 DEC 86 - 30 NOV 87
FARM: BREEDING FARM

PigCHAMP 1.3
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Printed: 3 DEC 87

	AUG 87	SEP 87	OCT 87	NOV 87	DEC 86 NOV 87
BREEDING PERFORMANCE					
Total number of services	35	35	32	27	365
Number 1st services	29	26	28	21	337
Number repeat services	6	9	4	6	28
Percent repeat services	17.1	25.7	12.5	22.2	7.7
Percent multiple matings	0.0	8.6	0.0	7.4	24.7
Weaning - 1st service interval	6.8	9.7	11.3	7.1	13.1
Percent sows bred by 7 days	87.0	61.1	76.9	75.0	73.3
Entry - 1st service interval	0	4	0	7	1
FARROWING PERFORMANCE					
Number of sows farrowed	28	27	29	31	307
Ave parity of farrowed sows	6.5	6.6	6.6	5.1	5.9
Total pigs born alive	249	243	262	240	2869
Average total pigs per litter	10.0	10.0	10.0	8.5	10.0
Average pigs born alive/litter	8.9	9.0	9.0	7.7	9.3
Average pigs born dead/litter	1.1	1.0	0.9	0.8	0.6
Percent born dead	11.1	10.0	9.3	9.1	6.1
Percent mummies	0.0	0.0	0.0	0.0	0.0
Litters less than 7 born live	7	5	6	11	40
Percent < 7 born live	25.0	18.5	20.7	35.5	13.0
Average birth weight	.	.	.	.	.
Farrowing rate	93.3	93.1	78.4	81.6	93.0
Average gestation length	115	114	114	115	115
Farrowing interval	156	166	153	157	159
Litters / mated female / year	2.42	2.35	2.35	2.45	2.42
WEANING PERFORMANCE					
Number of litters weaned	34	22	30	23	293
Total pigs weaned	233	166	231	187	2360
Pigs weaned per litter	6.9	7.5	7.7	8.1	8.1
Pigs weaned per sow farrowed	8.3	6.1	8.0	6.0	7.7
Pre-weaning mortality	14.0	22.4	17.8	8.8	15.9
Average weaning weight	.	.	.	.	.
Average age at weaning	24.1	25.0	26.9	27.6	26.9
Average Ohio SPI	.	.	.	.	.
Pigs weaned/mated female/year	20.5	14.8	19.3	15.5	19.2
POPULATION					
Ending female inventory	165	160	156	169	169
Average parity	4.5	4.4	4.5	4.0	4.0
Average female inventory	155.8	162.4	158.4	160.7	142.3
Gilts entered	17	3	2	19	83
Replacement rate	128.5	22.5	14.9	143.8	58.3
Sows and gilts culled	7	8	6	6	28
Culling rate	52.9	59.9	44.6	45.4	19.7
Ave parity of culled sows	9.3	8.1	5.8	10.5	8.4
Sow and gilt deaths	0	0	0	0	0
Death rate	0.0	0.0	0.0	0.0	0.0
Ending boar inventory	23	25	27	27	27

APPENDIX D

PERFORMANCE MONITOR
1 DEC 86 - 30 NOV 87
FARM: NEW FARM

PigCHAMP 1.3
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Printed: 6 DEC 87

	AUG 87	SEP 87	OCT 87	NOV 87	DEC 86 NOV 87
BREEDING PERFORMANCE					
Total number of services	248	269	233	265	2655
Number 1st services	221	218	191	210	2468
Number repeat services	27	51	42	55	187
Percent repeat services	10.9	19.0	18.0	20.8	7.0
Percent multiple matings	0.4	0.0	0.9	0.0	1.1
Weaning - 1st service interval	13.9	13.2	7.7	8.8	12.3
Percent sows bred by 7 days	74.3	73.1	87.1	81.3	77.3
Entry - 1st service interval	0	13	26	54	6
FARROWING PERFORMANCE					
Number of sows farrowed	190	200	212	207	2230
Ave parity of farrowed sows	5.3	5.5	5.5	5.5	5.2
Total pigs born alive	1809	1903	1937	1914	22183
Average total pigs per litter	10.2	10.1	9.8	10.0	10.5
Average pigs born alive/litter	9.5	9.5	9.1	9.2	9.9
Average pigs born dead/litter	0.7	0.6	0.7	0.7	0.6
Percent born dead	6.8	6.3	6.7	7.4	5.6
Percent mummies	0.0	0.0	0.0	0.0	0.0
Litters less than 7 born live	27	31	38	35	173
Percent < 7 born live	14.2	15.5	17.9	16.9	7.8
Average birth weight	.	.	.	.	.
Farrowing rate	94.1	96.2	93.0	84.8	96.6
Average gestation length	114	115	114	114	114
Farrowing interval	151	157	157	155	156
Litters / mated female / year	2.32	2.45	2.43	2.38	2.47
WEANING PERFORMANCE					
Number of litters weaned	193	196	208	197	2169
Total pigs weaned	1711	1617	1689	1621	19325
Pigs weaned per litter	8.9	8.2	8.1	8.2	8.9
Pigs weaned per sow farrowed	9.0	8.1	8.0	7.8	8.7
Pre-weaning mortality	8.6	9.0	12.8	11.2	10.0
Average weaning weight	.	.	.	.	.
Average age at weaning	27.1	25.6	25.5	26.8	26.8
Average Ohio SPI	.	.	.	.	.
Pigs weaned/mated female/year	21.4	20.3	19.9	19.1	21.9
POPULATION					
Ending female inventory	1082	1113	1095	1099	1099
Average parity	4.6	4.5	4.5	4.6	4.6
Average female inventory	1074.5	1111.5	1109.1	1099.7	994.5
Gilts entered	29	57	15	27	361
Replacement rate	31.8	62.4	15.9	29.9	36.3
Sows and gilts culled	12	26	33	23	94
Culling rate	13.1	28.5	35.0	25.4	9.5
Ave parity of culled sows	7.8	4.8	7.5	5.6	6.3
Sow and gilt deaths	0	0	0	0	0
Death rate	0.0	0.0	0.0	0.0	0.0
Ending boar inventory	51	59	62	61	61

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APPENDIX E

PERFORMANCE MONITOR
DEC 86 - 30 NOV 87
FARM: OLD FARM

PigCHAMP 1.3
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Printed: 6 DEC 87

	AUG 87	SEP 87	OCT 87	NOV 87	DEC 86 NOV 87
BREEDING PERFORMANCE					
Total number of services	139	124	143	127	1346
Number 1st services	121	101	109	95	1236
Number repeat services	18	23	34	32	110
Percent repeat services	12.9	18.5	23.8	25.2	8.2
Percent multiple matings	0.0	0.0	0.0	1.6	0.7
Weaning - 1st service interval	12.3	11.9	7.5	6.6	13.6
Percent sows bred by 7 days	80.4	69.6	77.7	85.1	71.7
Entry - 1st service interval	2	6	16	15	3
FARROWING PERFORMANCE					
Number of sows farrowed	90	99	91	117	1080
Ave parity of farrowed sows	4.9	4.7	5.3	4.9	4.6
Total pigs born alive	833	928	819	1102	10554
Average total pigs per litter	9.6	9.7	9.3	9.7	10.0
Average pigs born alive/litter	9.3	9.4	9.0	9.4	9.8
Average pigs born dead/litter	0.3	0.4	0.3	0.3	0.2
Percent born dead	3.6	3.8	3.5	3.0	2.4
Percent mummies	0.0	0.0	0.0	0.0	0.0
Litters less than 7 born live	14	16	22	19	106
Percent < 7 born live	15.6	16.2	24.2	16.2	9.8
Average birth weight					
Farrowing rate	94.7	92.5	85.0	81.8	95.2
Average gestation length	115	115	115	115	115
Farrowing interval	161	157	156	159	157
Litters / mated female / year	2.21	2.38	2.04	2.63	2.57
WEANING PERFORMANCE					
Number of litters weaned	98	96	93	97	1017
Total pigs weaned	854	713	808	810	8834
Pigs weaned per litter	8.7	7.4	8.7	8.4	8.7
Pigs weaned per sow farrowed	9.5	7.2	8.9	6.9	8.2
Pre-weaning mortality	0.5	14.8	10.9	9.3	10.9
Average weaning weight					
Average age at weaning	27.3	23.7	25.8	26.1	26.5
Average Ohio SFI	.				
Pigs weaned/mated female/year	22.1	17.9	18.6	18.7	22.0
POPULATION					
Ending female inventory	551	558	560	564	564
Average parity	3.9	3.7	3.7	3.7	3.7
Average female inventory	550.2	553.2	557.3	561.5	490.8
Gilts entered	25	32	16	22	277
Replacement rate	53.5	70.4	33.8	47.7	56.4
Sows and gilts culled	19	25	14	18	78
Culling rate	40.7	55.0	29.6	39.0	15.9
Ave parity of culled sows	4.4	6.2	6.1	6.6	5.7
Sow and gilt deaths	0	0	0	0	0
Death rate	0.0	0.0	0.0	0.0	0.0
Ending boar inventory	23	23	28	27	27

APPENDIX P

SOW SUMMARY CARD
FARM: NEW FARM

PigCHAMP 1.3
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Sow: LY0010	Parity: 4	Status: SERVED				
Birth date:	Sire:	Dam:	Breed: LY			

PARITY	0	1	2	3	4	AVERAGE
Farrow date			18DEC86	13MAY87	8OCT87	
Total born			10	12	10	10.7
Born alive			10	11	8	9.7
Stillborn			0	1	2	1.0
Mummies			0	0	0	0.0
Gestation length			113	113	111	112
Lactation interval				146	148	147
Ave birth weight						
Not fostered					1	
Weaning date			15JAN87		5NOV87	
Pigs weaned			8		8	8.0
Age at weaning			28		28	28.0
Ave weaning weight						
Ohio SPI						
Nursed and weaned						
No. of services		1	1	1	1	1.0
First service		27AUG86	20JAN87	19JUN87	10NOV87	
Last service						
Boar		D1046	D0560	W0321	W0000C	

1 day date:	1 DEC 87	35 day date:	15 DEC 87	110 day date:	28 FEB 88	

APPENDIX G

BOAR PERFORMANCE REPORT
26 NOV 86 - 25 NOV 87
FARM: BREEDING FARM

PigCHAMP 1.3
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Printed: 26 NOV 87

BOAR ID	TOTAL MATINGS	AVERAGE PARITY SERVICE	SINGLE BOAR SERVICES	NUMBER RETURNED	NUMBER FARROWED	AVERAGE BORN LIVE	AVERAGE BORN DEAD	AVERAGE PARITY FARROW
-----	-----	-----	-----	-----	-----	-----	-----	-----
-BLANK-	1							
D0004	1	0.0	1	1 100%	0 0%			
D0020	8	1.9	8	1 13%	7 88%	9.3	0.4	2.7
D3031B	3	0.7	3	2 67%	0 0%			
D3033	19	2.0	18	3 17%	5 28%	8.2	1.2	3.4
D3034	1	0.0	1	0 0%	0 0%			
D6400	1	3.0	1	0 0%	0 0%			
L3022	42	6.7	17	1 6%	7 41%	8.9	1.1	9.0
L7065	9	7.0	1	0 0%	1 100%	10.0	2.0	8.0
L7283M	2	0.5	2	0 0%	0 0%			
L7286	10	2.5	4	1 25%	3 75%	9.7	0.0	3.3
L7288	11	0.4	9	0 0%	3 33%	8.3	0.3	1.0
L7388	1	1.0	1	0 0%	0 0%			
-L7846	1	0.0	1	0 0%	0 0%			
L7846M	1	0.0	1	0 0%	0 0%			
L8023	45	5.5	23	3 13%	10 43%	10.6	0.5	8.3
P0000B	2	2.0	2	0 0%	2 100%	9.5	2.0	3.0
W0341	29	4.8	17	0 0%	13 76%	9.3	1.0	5.2
W451	16	3.3	11	1 9%	6 55%	9.2	0.7	4.0
W478	22	5.2	13	1 8%	12 92%	8.2	0.4	5.9
W502	18	5.6	9	0 0%	8 89%	9.6	0.9	6.6
Y2682	42	5.1	27	3 11%	13 48%	8.2	0.3	4.5
Y3120	14	1.0	9	3 33%	6 67%	7.7	0.7	1.0
Y6846	31	3.5	26	2 8%	7 27%	9.9	0.0	1.6
Y9004	8	5.0	2	0 0%	2 100%	9.0	0.0	6.0
Y9016	32	5.4	19	1 5%	6 32%	10.2	1.5	5.2
Y9024	36	6.0	23	0 0%	9 39%	9.4	0.0	5.1
TOTAL	405	4.2	249	23 9%	120 48%	9.1	0.6	4.9

26 BOARS LISTED.

APPENDIX H

Feed Costs And Amount

Feed costs amounts to 70–80% of the total costs per Kg live weight produced. Any savings which can be made in the purchase of feeds will beneficially affect the profit.

Feed Requirement Per Day

<u>Animal</u>	<u>Kg/Day</u>
Boar	2.5
Sow	2.5
Lactating Sow	4 or >
Gilts	2
Weaners	0.6
GROWER–FINISHER	
12Kg	0.6
20Kg	0.9
30Kg	1.2
40Kg	1.5
50Kg	1.8
60Kg	2.2
60–80Kg	3.0

a) Lactation Sow

12 Wks x 7 Days x 4 Kg = 366Kg/sow

1100 sows in NF @ 366 = 370 tonne.

Each Tonne Costs \$500.00

370 Tonne costs = \$185,000.00

b) Dry And Pregnant Sow

40 Wks x 7 Days In A Week x 2.5Kg	=	700Kg/sow
1100 sows @ 700	=	770 tonne
770 Tonne @ \$450.00	=	\$346,500.00

c) Boars

50 Boars x 365 Days x 2.5Kg	=	46 tonne
46 Tonne @ \$450.00	=	\$20,000.00

d) Weaners

19180 Weaners at 2Kg/weaner	=	38.36 tonne
38.36 tonne @ \$600.00	=	\$23,016.00

e) Feeding Pigs

230Kg/porker - 230Kg x 19100	=	4393 tonne
4393 tonne @ \$450.00	=	\$1,976,850.00

Total feed costs to produce 19100 porkers is \$2,551,886.00

APPENDIX I

Relationship between the feed cost and feed conversion ratio.

4

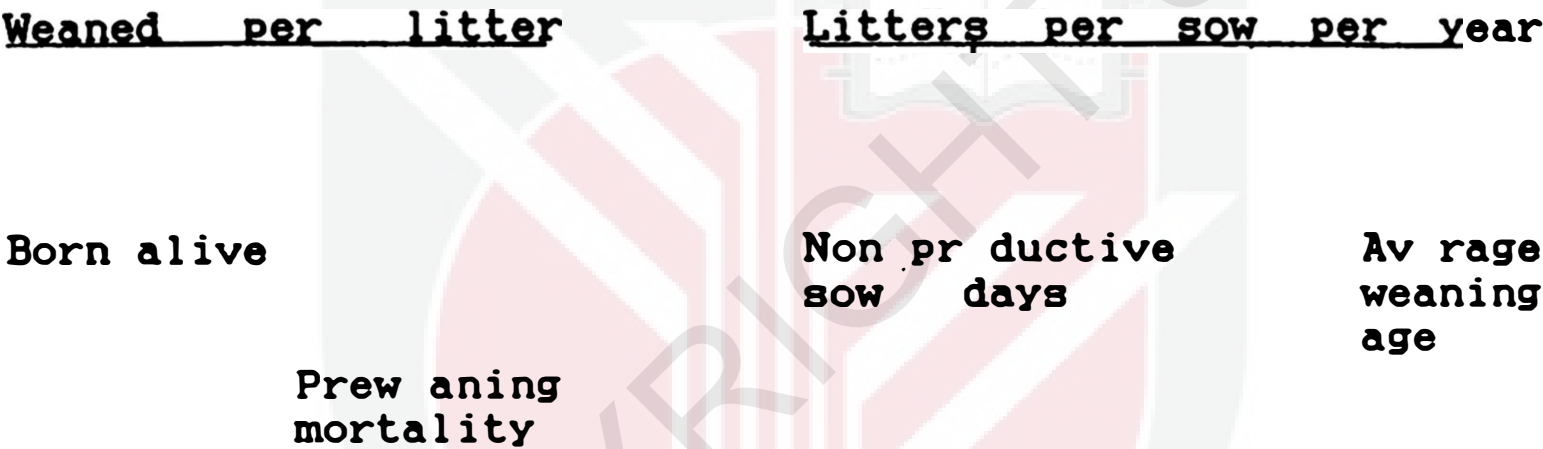
Feed Cost Per Kg Live Weight Gain.

Feed Cost Per Tonne (\$)	Feed Conversion Ratio.				
	2.8	3.0	3.2	3.4	3.6
450	126.0	135.0	144.0	153.0	162.0
460	128.8	138.0	147.2	156.4	165.6
470	131.6	141.0	150.4	159.8	169.2
480	134.4	144.0	153.6	163.2	172.2
490	137.2	147.0	156.8	166.6	176.4
500	140.0	150.0	160.0	170.0	180.0
510	142.8	153.0	163.2	173.4	183.6
520	145.6	156.0	166.4	176.8	187.2
530	148.4	159.0	169.6	180.2	190.8
540	151.2	162.0	172.8	183.6	194.4
550	154.0	165.0	176.0	187.0	198.0

APPENDIX J

Sow productivity as indicated by the number of piglets weaned per sow per year and the interrelationship between factors contributing to it.

Piglets Weaned Per Sow Per Year



APPENDIX K

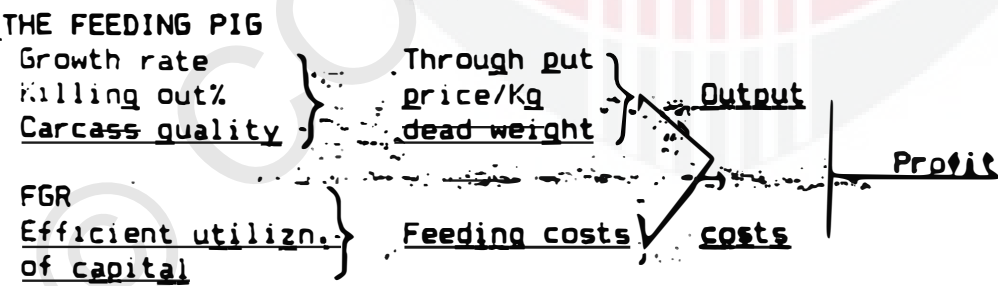
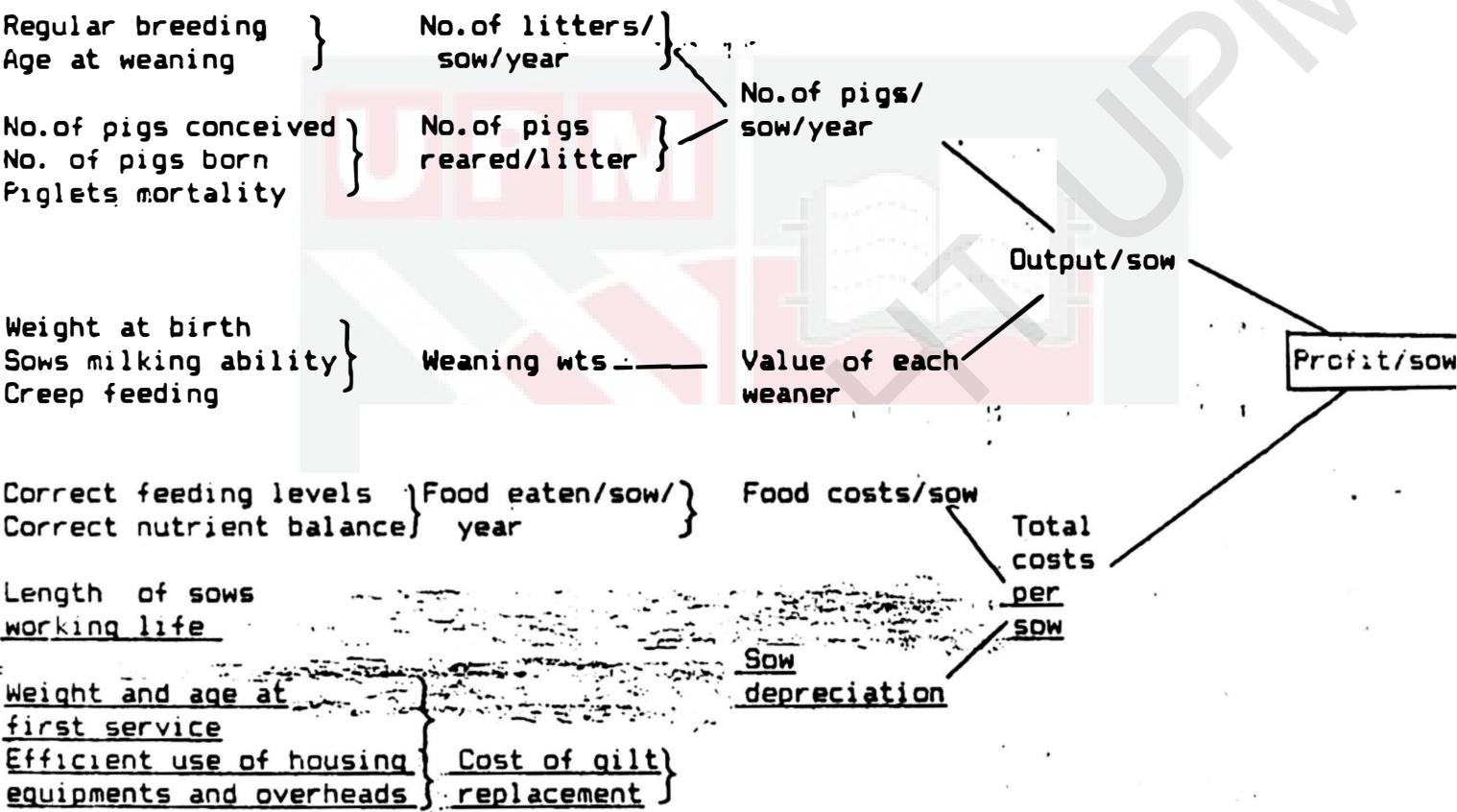
STANDARDS OF PRODUCTION AND DISEASE
FOR BREEDING SWINE HERD

ON 5 WEEKS WEANING PROG.	TARGET	INTERFERENCE LEVEL
Weaning to service (days)	7	9
Return to service (%)	6	12.0
Abortion (%)	0.8	2.5
Infertile (%)	2.0	5.0
Farrowing rate (%)	89.0	80.0
Sow death/year (%)	2.2	3.0
Live pigs/litter	10.9	10.0
Still born (%)	5.0	8.0
Mummified	0.5	1.0
Pigs weaned/litter	9.6	9.0
Death to weaning (%)	8-12	12-18
Litter < 8 pigs (%)	10.0	18.0
Laid on	5.0	7.0
Congenital defects	0.5	1.5
Low viability	1.5	3.0
Starvation	1.0	3.0
Death from diarrhoea	0.5	2.0
Misc. death	3.0	5.0
Litter/sow/year	2.25	2.0
Pigs sold/sow farr./year	21.0	19.0
Post weaning death	1.5	2.5
Finishing death	2.0	3.0
Sows culled/100 sows/month	3.0	

Muirhead M.R 1976, Vet. Rec. 99:288-292.

APPENDIX L

Factors Affecting Profitability Of Breeding Pigs



By Thornton K. 1981.



Plate 1 Water source a suitable pond for fresh water fish culture.



Plate 2 Field mill and newly dug pond



Plate 3 Gilts from BF only the best gilts
are selected and distributed to NF and OF.



Pl 4 Bo rs f om BF - unso nd bo s culle



Plate 5 Farrowing pens at NF note the clean dry environment. Empty sacks are hanged by the side to prevent cold drift or excessive sunlight.





Plate 7 Weaners pen under slatted steel floor.
Note the animals are kept very clean.



Pl Weaners on concrete floor in F.