

# PIG BREEDING AND UTILIZATION OF SEMEN IN MALAYSIA

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## ABSTRACT

*Pigs are commonly farmed in many countries. Domestic animals were probably first introduced into the Peninsular Malaysia by early human migrants. Pig industry in Peninsular Malaysia is moderate developed and has improved in management and breeding recent years. Breeding parameters have improved as the farm and waste management are given essential emphasis. Common pig breeds in Malaysia are Duroc, Large White and Landrace. In 2016, pig industry in Malaysia has achieved 96% self-sufficient in local pork demand with 509 farms and 1.39 million of standing pig population. The main mode of pig breeding is using artificial insemination and two or three way crossing is commonly practice in Malaysia. There are several issues that pig farmers are facing now include limitation of agriculture land, cost of production, lack of youth in farming and diseases. The pig industry is now moving towards modern pig farming method for to solve the environmental issue, increase in productivity and to strengthen farm biosecurity.*

*Keywords: Pig industry, artificial insemination, breeding, modern pig farming, Malaysia*

## INTRODUCTION

The rearing of pigs is closely associated with Chinese settlement in Malaysia. In the early days, it was common for Chinese vegetable farmers in Peninsular Malaysia to keep a few Local Chinese Pig (LCP) which are also known as South China Pig. There were two types of South China Pig, namely the South China (Hainan) which resembles the baconer type and the South China Black (Canton) which resembles the porker type. They were however very hardy, resistant to disease and parasites, very prolific, had both superior litter size at birth and at weaning, and exhibited good mothering ability.

Steps to improve the genetic quality of pigs were initiated by the crossbreeding of local pigs with exotic breeds such as the Middle White, Large Black and Poland China. Since then a multitude of pig breeds have been imported and tested by pig breeders, including Large White (Yorkshire), Landrace, Duroc, Hampshire, Tamworth, Chester White, Pietrain and Berkshire. During this time also, the benefits of heterosis through crossbreeding of various breeds had been realized and exploited by pig farmers. Today, the main breeds being utilized are the Large White, Landrace, Duroc, Chester White, Hampshire and Pietrain.

The pork consuming population in Malaysia is statically as 40% of the 31.7 million population in Malaysia. To date, Malaysia is able to achieve 93.60% of pork self-sufficiency with the current 509 farm and 1,399,890 heads of pigs. The local consumption of pork is 207,263 metric tons and the average cost of production for pork is RM 8.55/ kg in 2016.

## PIG BREEDING AND PRODUCTION

### Modern Pig Farming (MPF)

Pig industry in Malaysia is moderate developed and has improved in management and breeding recent years. Majority of the pig farms in Malaysia are licensed for operation, only the minority unable to operate legally as they do not adhere to the rules and regulation set by the local authorities. In 2015, Department of Veterinary Services (DVS) proposed MPF to the pig farmers and eventually in 2018, all the pigs in Malaysia need to be kept in closed house method. Pig farmers need to practice on MPF system whereby there is zero-discharge of the waste water into the public drainage and waterway, the waste water is contained and locked within the

Farm to prevent pollution occurred. By practicing MPF, a pig farm is compulsory to have buffer zone with a minimum of 200 meter apart from the residential and public amenities and follow Good Animal Husbandry Practice (GAHP).



Fig. 1 Examples of pig closed house in Malaysia

### Common Breed of Pig

The main breeds being utilized in most of the pig farm are the Large White, Landrace, Duroc, Chester White, Hampshire and Pietrain. Pig breeds are divided into two main lines in Malaysia for cross breeding purposes namely the male line and the female line. Cross breeding produces hybrid vigour or heterosis by combining desirable traits of two or more breeds to produce a pig with more optimum trait (DVS Malaysia, 1986). Cross breed pigs have some advantages over pure breed pigs because of a genetic phenomenon in order to enhance and improve certain trait over the average of its parent pure breeds. In Malaysia, the female line comprises of predominantly Large White and Landrace for the characteristic of good mothering ability, good temperament and large litter size. On the other hand, the selected male line includes Duroc, Hampshire, Pietrain and to some extent the Large White for the characteristic of carcass merits as well as the feed conversion ratio.

Breed	Common Commercial Crosses		Common Usage for Porker Production
	2-way	3-way	
Duroc (D)	LW x LR	D x LR/ LW	Male Line
Large White (LW)	LR x LW	D x LW/ LR	Male/ Female Line
Landrace (LR)	D x LR		Female Line
Chester White (CW)	D x CW	P x CW/ LR	Male Line
Hampshire (H)		P x LW/ LR	Male Line
Pietrain (P)			Male Line

Table 1 Common commercial crosses (DVS Malaysia, 1986)

Traits	Heritability (%)	Degree of Heritability
Performance traits		
- Litter size at birth	15	Low
- Post weaning rate of weight gain	29	Medium
- Feed per unit of weight gain	31	Medium
- Litter size at weaning	12	Low
- Litter weight at weaning	17	Low
Anatomical traits		
- Length of body	59	High
- Length of legs	65	High
- Number of vertebrae	75	High
- Number of nipples	15	Low
Carcass traits		
- Length	59	High
- Loin eye area	48	High
- Ham weight	58	High
- Shoulder weight	47	High
- Fat cuts	63	High
- Lean cuts	31	High

Table 2 Common commercial crosses (DVS Malaysia, 1986)

## UTILIZATION SEMEN OF PIG

### Artificial insemination (AI) Heat Detection

Detection of oestrus or standing heat is one of the most critical components of a successful pig breeding program. Accurate heat detection is essential for the accurate timing of artificial insemination. Errors in detection of oestrus reduce reproductive performance and increase herd non-productive days. However, heat is often misdiagnosed or missed because the signs are overlooked. Consistent detection of oestrus is necessary to ensure insemination occurs near the time of ovulation.

Gilts develop sexual maturity by the age of seven months. Gilt is commonly inseminated within 16 hours after first positive heat detection and every 12 hours afterwards as long as still standing in oestrus. Generally after three to 10 days of weaning, 90% sow is usually return to oestrus. The best time to inseminate sow is within 24 hours.

Heat Signs	Too Early	In Time	Too Late
Vulva	Heavily swollen, dark red in color, no or few slime secretion	Less swollen, less red in color and slime secretion	Not swollen anymore, normal in color and slime is sticky
Reflex	Female stays if the herdsman is pushing the sides, it does not stay properly or the herdsman	Female stays clearly for the herdsman and shows a remarkable moving if its ears	Female does not stay for the herdsman anymore, but still allow boar to climb
Behavior	Female is restless and climbs other females	Female is quite, is climbing by other females and stays	No signs of climbing on other pigs

Table 3 Signs of Heat Detection (Ing, H.S., n.d)

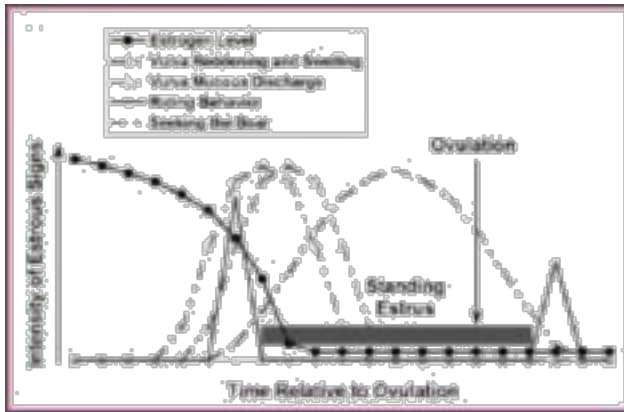


Fig. 2 Level of oestrogen and intensity of typical preliminary signs of oestrus relative to ovulation in sows



Artificial insemination



semen collection



semen evaluation

Fig 2 Artificial insemination in sow, semen collection and semen evaluation from boar in Chau Yang farming, State of Perak, Malaysia

### Boar Selection

The selection of young boar can be done when it reach the age of 220 days. A qualified boar must physically fit, able to mount on the dummy, free of genital abnormalities and explicit enough libido. An oestrus female is not required when collecting semen to be used for artificial insemination as boars are naturally show interest in mounting stationary objects. Boars are taught to mount on the dummy as young as five-month old. Meanwhile the training, the abnormalities of the genital can be observed to avoid small testicles or penis, persisting frenulum and insufficient of penal erection.

Determining the initial quality of a boar ejaculate is important to obtain satisfactory fertility rates. Effective screening methods for ejaculates prior to processing are necessary for improving on farm reproductive performances. Freshly collected semen is analyzed in the laboratory to confirm the sperm quality. Minimum semen quality values for fresh and unextended boar semen processed and used for AI are indicated in Table 4.

Semen Variables	Value
Appearance	Milky to creamy consistency
Color	Grey-white to white in color
Total Sperm numbers	>15 x 10 <sup>9</sup> sperm/ ejaculation
Gross Motility (unextended)	≥ 70%
Abnormal Morphology	≥ 20%
Cytoplasmic Droplets	< 15%

Table 4 Minimum values of fresh boar semen processed and used for AI. (Aithouse, GC. Compend Continue Education Practice Vet 19(3):400-404, 1997)

## Conclusion

Despite the decreased of pig farms in the recent years, the production of pork to the local demand still maintained. The major problem that caused the decrease of the pig farm mainly because of the limitation of the agricultural land and improper town planning, the residential area is getting closer and closer to the farm area nowadays. Public is complaining about the odour and pig waste, thus modern pig farming is the best way to encounter the environmental issue. By implementing biogas with the application of methane recovery and utilization to the modern pig farming is an effective way of treating wastewater with high organic pollutants in an environmentally friendly manner. Apart from reducing waste and greenhouse emission, biogas generated can be used to generate clean energy in the form of electricity and heat. The future prospect of Malaysia's pig farm is to practice modern pig farming in order to sustain the pig industry in the country.

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