



Improvement of Pig Breeding and Veterinary Program to Produce Better Quality Pigs for Use in Healthcare and Academic Research

Edgar M Pena DVSM, Singhealth Corporate Office
Redmond Cheng DVM, Singhealth Corporate Office
Bryan Ogden DVM, DACLAM, Singhealth Corporate Office

A. Introduction

Pigs or swine (*Sus scrofa*) are used extensively in academic and healthcare research as an alternative to other mammalian species e.g. dogs, goat, sheep etc. The resemblance of domestic pig GI tract anatomy and physiology to human makes them a choice species for internal medicine research. Some of the world's renowned research that lead to successful human heart transplant used pig as the translational research animal model. The 1977 Nobel Prize winner study that used pig and sheep hypothalamus was able to isolate and sequence thyroid stimulating hormone (*Schally, A.V.*). Throughout the years, Singhealth Experimental Medicine Centre (SEMC) and its satellite research facility in Sembawang now called National Large Animal Research Facility (NLARF) has been the source of domestic pig for use in academic and health care research in Singapore. Breeding and producing domestics pigs for research is challenging due to tough regulatory environment and fulfilment of researcher's requirement in terms of numbers, size and gender needed in their studies. Most importantly, pigs for research should possess a good health status with low if not zero zoonotic risk for handlers, investigators and to the community. The option to import from overseas will hurt the research funds as its usually expensive and NLARF as a national resource should provide sufficient supply to local needs.

B. Objectives/Aims

- To produce high health status pigs and prevent exposure of handlers to zoonotic¹ diseases.
- To breed and produce sufficient number of pigs and fulfil the requirements of local research community.

C. Methodology

C.1. NLARF Veterinary and Management Team has designed pig quarantine, conditioning and breeding program to ensure that the foundation of breeder will be in line with getting genetically superior breeders and high health status pigs for use in research

Step 1. Veterinary Team and Management review of performance and health record of old breeding colony



Step 6. NLARF Breeder and Conditioning Program

Step 2. Sourcing of genetically superior Parent Stocks (PS) from Overseas.

Step 3. Evaluation of Herd Health Status and Performance record review of overseas source by NLARF Veterinary and Management team.

Step 4. Accreditation of overseas source by Agri-food and Veterinary Authority (AVA) of Singapore.

Step 5. Import and Quarantine of Breeders at NLARF

C.2 . Stringent Evaluation/Monitoring of Breeder Performance, Health assessment and gathering of users feedback



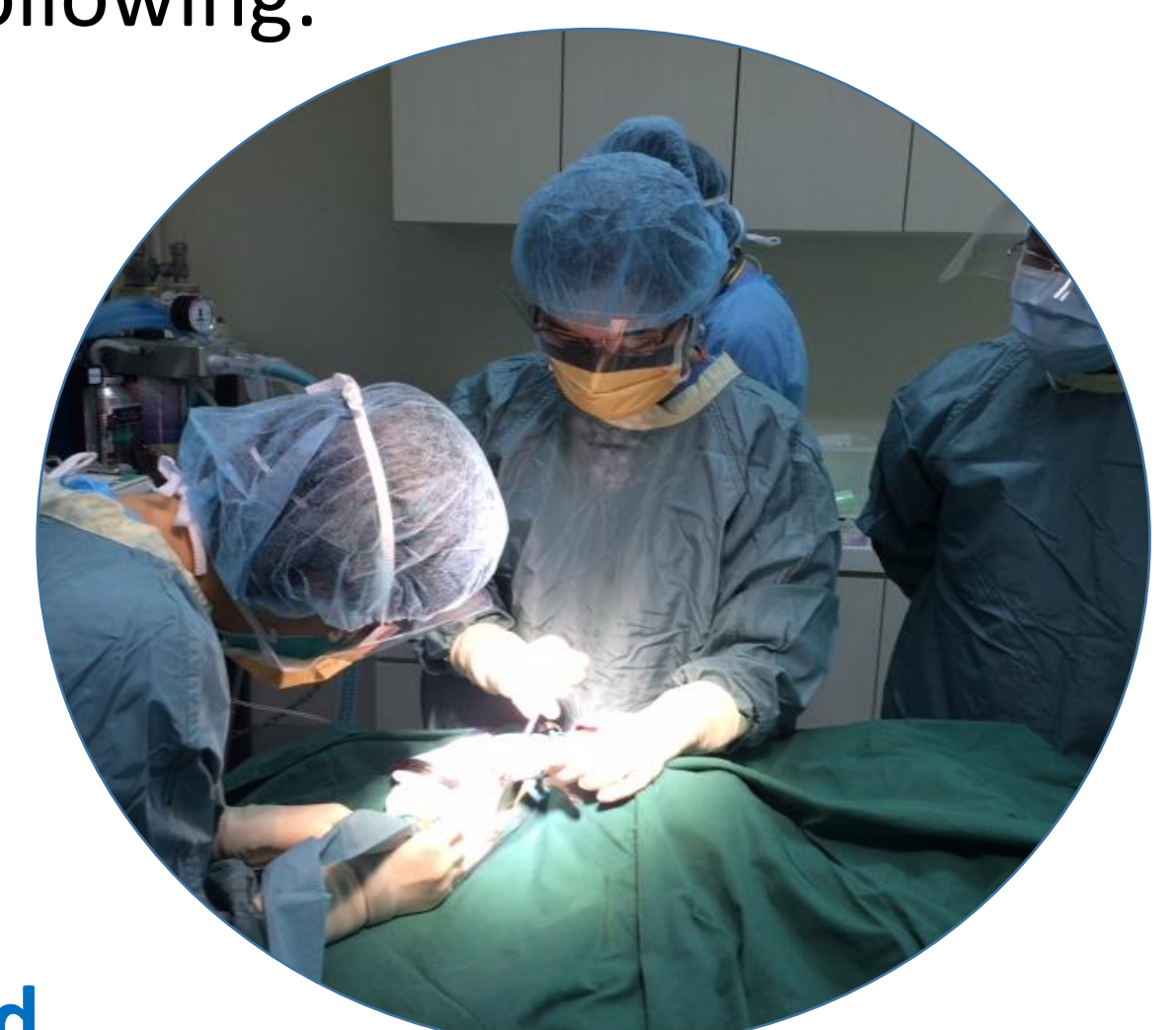
SOW NAME: SERENA		Ear Notch: 3763		Date of Birth: 16-Jan-13		Abolic		ESF - Expected Date of Farrowing		LSBA - Litter Size at Birth		SS - Still Birth			
						ADF - Actual Date of Farrowing		LSW - Litter Size at Weaning		MF - Mummified					
BREEDING				FARROWING				WEANING							
BOAR NO.	NO.	MATED (Date)	21 days (Pos/Neg)	Partly (No.)	EDF	ADF	(Total)	LSBA	BW	M	F	SS/NF	DATE	LSW	WW
4891	1	30-Sep-14	21-Oct-14	1	22-Jun-15	22-Jun-15	14	1.09	6	8	0/0		19-Feb-15	14	7.48
4891	2	24-Feb-15	17-Mar-15	2	19-Jun-15	19-Jun-15	14	1.44	8	6	0/1		17-Jul-15	11	6.52
4891	3	22-Jul-15	12-Aug-15	3	13-Nov-15	13-Nov-15	10	1.2	5	4	0/0		10-Dec-15	10	6.8
4891	4	6-Jan-16	27-Jan-16	4	29-Apr-16	30-Apr-16	15		7	8	1				

- ❑ NLARF has designated an internal team of veterinary staff to closely monitor the Breeder performance.
- ❑ A regular health check/evaluation and Veterinary Care SOPs are in place to ensure that the pigs produced maintain its high health status.
- ❑ Health and breeding program are evaluated quarterly and user's feedbacks are collated for reference during the review.
- ❑ A database pig recording system is used to ensure proper tracking of inventory and health status of pigs. The same system is used to monitor the movement and delivery of NLARF produced pigs to research institutions.



D. Results & Conclusion

- ✓ Since the commencement of new Pig breeding and Veterinary program, NLARF has accomplished the following:
- ✓ **Sufficient numbers or supply of pig according to local research demand.**
- ✓ **Supply of clean and high health status research pigs with low zoonotic risk.**
- ✓ **Affordable pig cost with high standard value produced locally and cheaper conduct of research.**
- ✓ **Better research result, creating more opportunities for discoveries to benefit local talents and further advancement of academic and healthcare experiments in Singapore.**



¹Zoonotic - diseases that can be transmitted from animal to human or vice versa