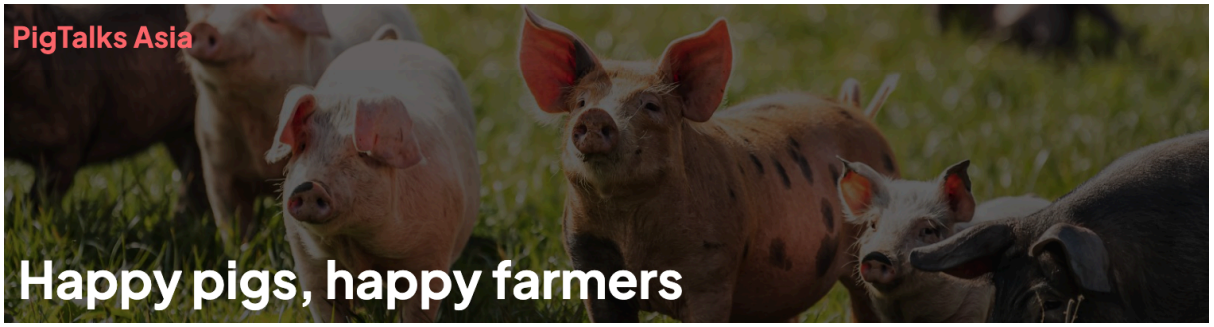
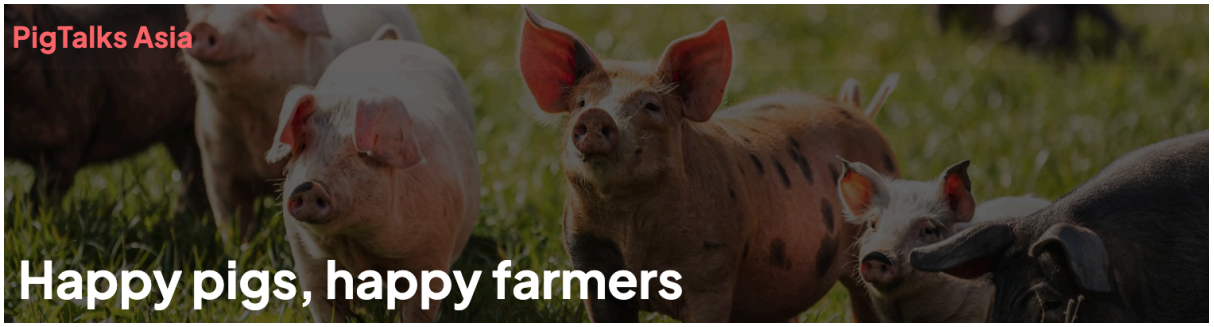


Streptococcus suis meningitis in weaners

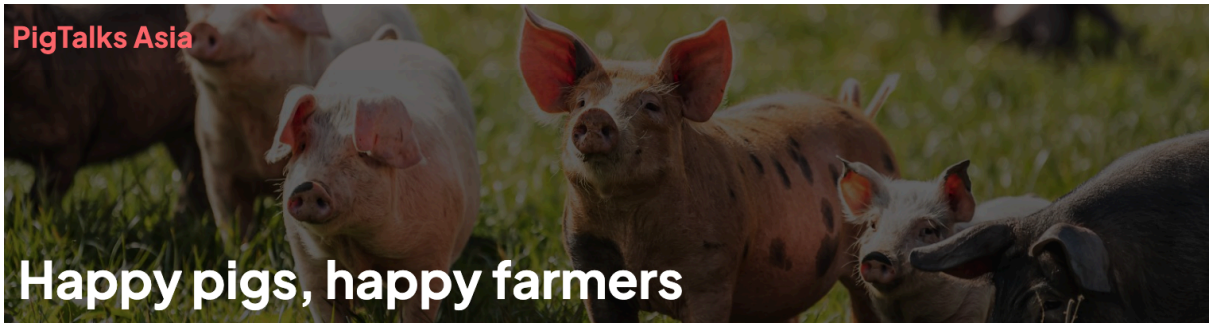
Note that this is a zoonotic pathogen – it can infect humans. Ensure staff wash their hands using soap after handling affected pigs. Cover all cuts and abrasions on the hands and arms.

Investigation of a problem on a farm

Treatment of an individual who is recumbent, fitting, or comatose		
	Remove from group	Place in a hospital area without other pigs while fitting.
	Inject with ceftiofur sodium 3mg/kg – this is 3x higher than the normal dose.	
	Inject with a painkiller - Meloxicam 0.4 mg/kg, for example	
	Reduce light levels	
	Provide water by mouth	
	If no response within 24 hours, euthanize	
Treatment of the group		
	Review the cost of treatment of the group vs. the individual. Individual cases are best treated individually, but may represent the beginning of an outbreak	
	Amoxycillin in the water supply for 3 days post-weaning. Amoxycillin can be difficult to dissolve.	
	Tetracycline in-feed from weaning to 18kg at a rate of 800ppm.	
	Inject all pigs at weaning with ceftiofur crystalline free acid (Excede 3 mg/kg)	
Investigation into an "outbreak" – sudden increase in cases on a farm within a pen		
Immediate	Check for PRRSv	Especially in a negative PRRSv herd
		Check for PRRSv in other pigs – conjunctivitis for example
	Check for PMWS/PCVAD	Ensure that the pigs were vaccinated at weaning – PCV2 Check vaccine purchases correspond to weaning numbers Check medicine storage – 2-8°C
	Post-mortem	Ensure diagnosis correct – differentials: Glässer's and Bowel Oedema. Gram stain on meninges/brain histology. Bacteriology: Note isolation of *Strep. suis II is* normal in most pigs. Take cerebral spinal fluid. Type the *Strep suis* – other strains may be a problem 1½ and 14, for example.
	Check weaning age and weight	Average and variance. Check the number of litters below 17 days of age and the number of litters that are from gilts. Piglets weaning below 5 kg
		If the problem also happens in the farrowing area, check colostrum intake.
	Check pig flow and all-in/all-out	
	Check water flow	700 mL per minute. One nipple drinker per 10 pigs



	Check temperature	At entry into nursery – 30°C Examine the cooling curve, looking for sudden changes – power failure,etc. Record weaner lying and defecation patterns
	Examine the clean building prior to entry	Particularly check that the room is dry. The room is warm. The room will not sweat.
Medium	Tag/mark piglets	Gilt litters and (differently) small piglets at weaning
Long term	See long-term problem investigation – eliminate all negative stressors on the pig post-weaning	
Investigation of long-term problem		
Streptococcus suis meningitis is a stress-induced problem. It is normal for the pig to be "infected" by 6 weeks of age; nearly 100% of pigs in a group will be carriers		
`	Pig flow and all-in/all-out	Review adherence to the pig flow programme. Nursery pigs need 0.3 m^2 per pig (to 30 kg) Total volume should be checked also – 0.8m^3 per pig
	All-in/all-out	AIAO by pigs, water, feed, floor, air, and medicine. Ensure needles and syringes are not used between different groups. Add lime-washing to the cleaning protocols
		Keep needles and syringes specifically for meningitis treatment
	Tools, Foot baths, clothing.	Run a batch concept for all equipment between rooms. Wear different footwear between rooms
		All staff are to wash their hands with soap after handling affected pigs
		Staff to wash hands with soap between batches
		Recovered pigs are not to return to the younger group of pigs
	Mortality and morbidity	Examine the mortality figures by batch Examine the morbidity figures by batch and age Examine the records using statistical process control – many "outbreaks" are not real, just part of natural variations.
	Feed-back programme	Feed back programme to gilts in isolation and sows 6 weeks pre-farrowing. Use faeces from 10-day weaned pigs and from "affected" age groups. Utilise rope feedback or tonsilar scrape programmes
	Temperature	Review the temperature cooling curve.
		Monitor curve with a remote sensor logger Ideal 30°C entry, cooling 1°C per week to 24°C
	Heating system	Gas heating – check the color of the flame and the CO concentrations.
		Many farms with a meningitis problem staff have "headaches"
	Air pollutants	High dust, endotoxin, and humidity (>75%RH) need to be eliminated.
		Note the level of slurry under the slats – air flow from underneath the slats.
	Air flow	Eliminate all draughts in the "proposed sleeping area"
		Examine the defecation pattern of pigs
		Examine and record the lying pattern of undisturbed pigs
		Smoke buildings.



	Water supply	Ensure a sufficient water supply – Observe the weaner's behaviour regarding drinkers. Water flow 700ml. One nipple drinker per pig, one bowl drinker per 20 pigs. Check the height of drinkers.
		Ensure clean water between batches.
		OxySan or Vircon S during the outbreak.
		pH of water post-weaning.
	Feed	Observe the weaner's behaviour regarding feeding.
		Record feed space (50 mm per pi,g 30 kg) and feeder management.
		Increase Vit E – 250 mg/kg and possibly Vit C.
		Review feeding and management of weaners immediately post-weaning
		Adopt a gruel feeding regime 3-4 days post-weaning
		Note if the time of the problem coincides with a change in diet/feed type and feed size
	Vaccine programme	Consider *Strep. suis* autogenous vaccine programme. Some commercial vaccines are available, but the response can be variable.
	Eliminate other problems	PRRSv, PCVAD/PMWS, and Mange are classical examples of problems.
		Eliminate any additional stressors at weaning – weighing, tagging, bleeding, etc.