In-vitro vaccine-matching for foot-and-mouth disease virus: does bovine vaccinal sera (BVS) impact upon the reliability of serological immune responses?

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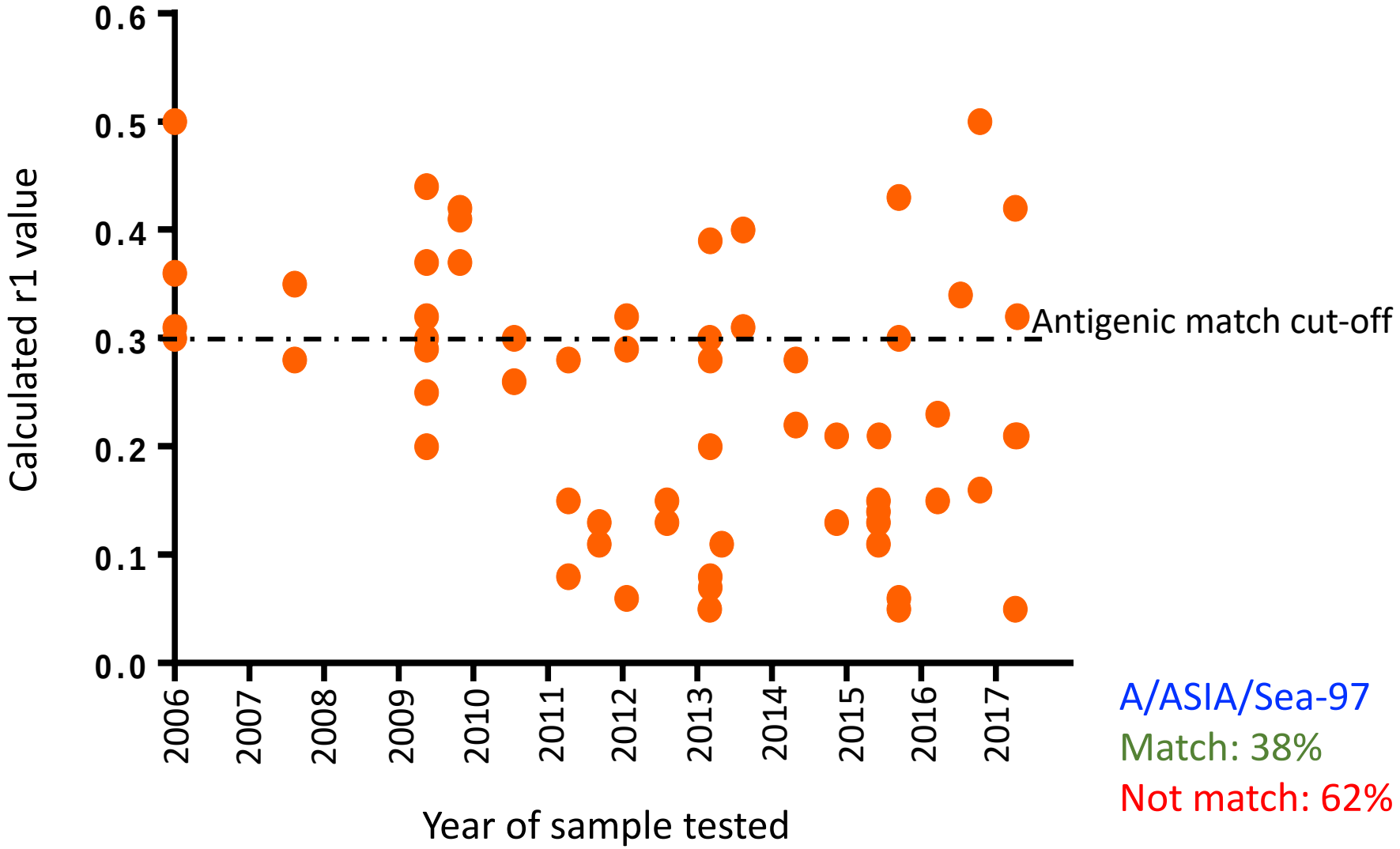
GFRA Bangkok
29th-31st 2019

Objectives

- to determine the effect of
  - Sampling time
  - Booster vaccination
  - Pooling sera

- Compare Virus neutralization test (VNT) vs Liquid phase blocking ELISA (LPBE)

Background: VDRL vaccine matching data A/ASIA/Sea-97 of mainland Southeast Asia



- Field observation do not necessarily support the in-vitro data.

Methodology: Bovine vaccinal sera (BVS)

6 Naïve cattle

Blood collection for the baseline data

Vaccination with 2ml monovalent (A/May-97 : $6PD_{50}$)

Sera collection pre-booster : 0, 7, 14 and 21dpv

Booster vaccination 21 dpv

Sera collection post-booster 28, 35, 42,49 and 56dpv

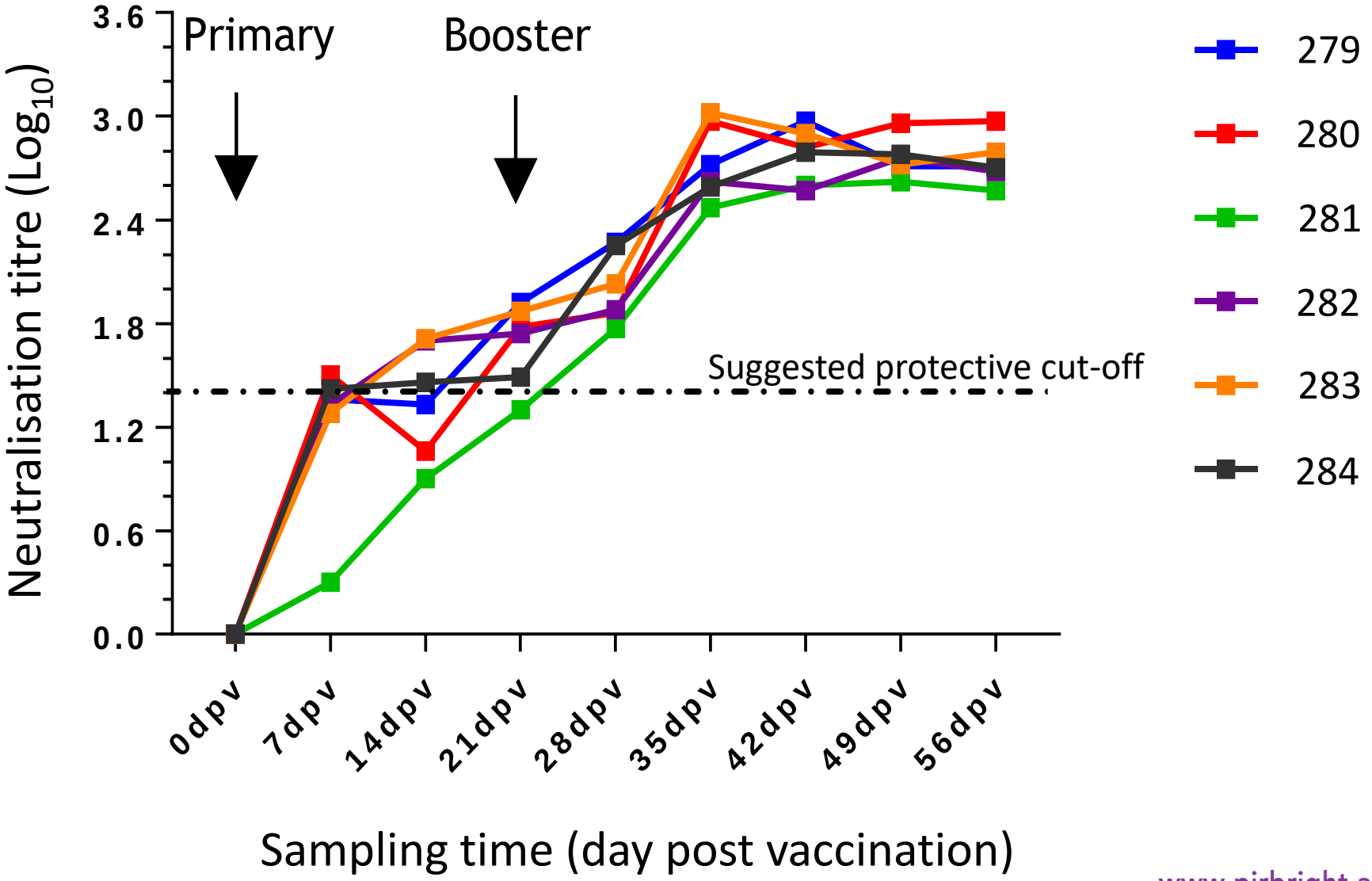
VNT & LPBE (individual sera and pooled sera).
Pool of 5
Pool of 6

Virus tested:
A/May-97
A/MAY/2/2011

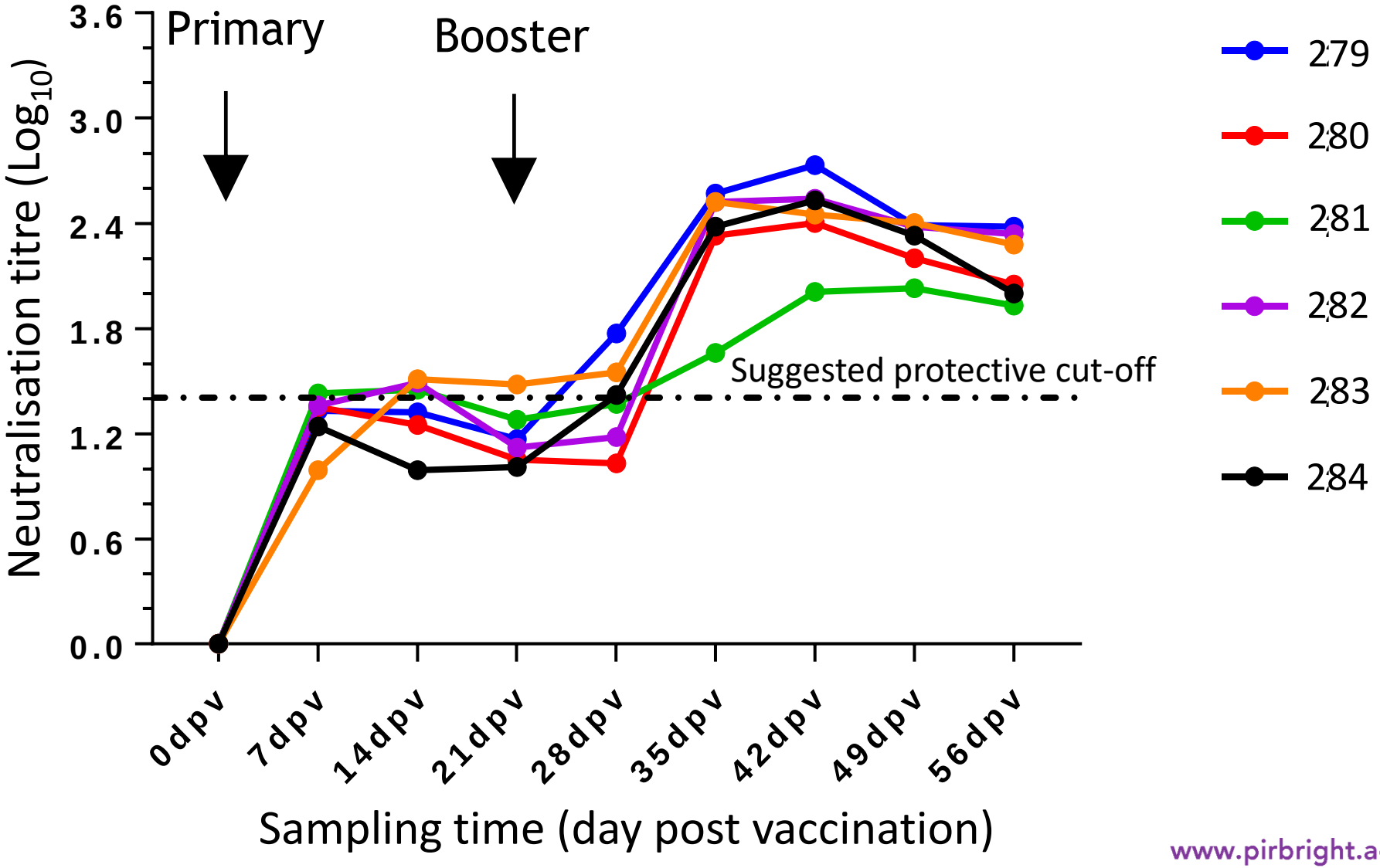
Methodology to decrease variability

- Confluency IB-RS-2 cells
- Carried out by one person
- Homologous & heterologous viruses were carried out simultaneously
- Same virus stock (Excipient: glycerol)
- Following UKAS ISO 17025 SOP
- Controls (virus & serum control)

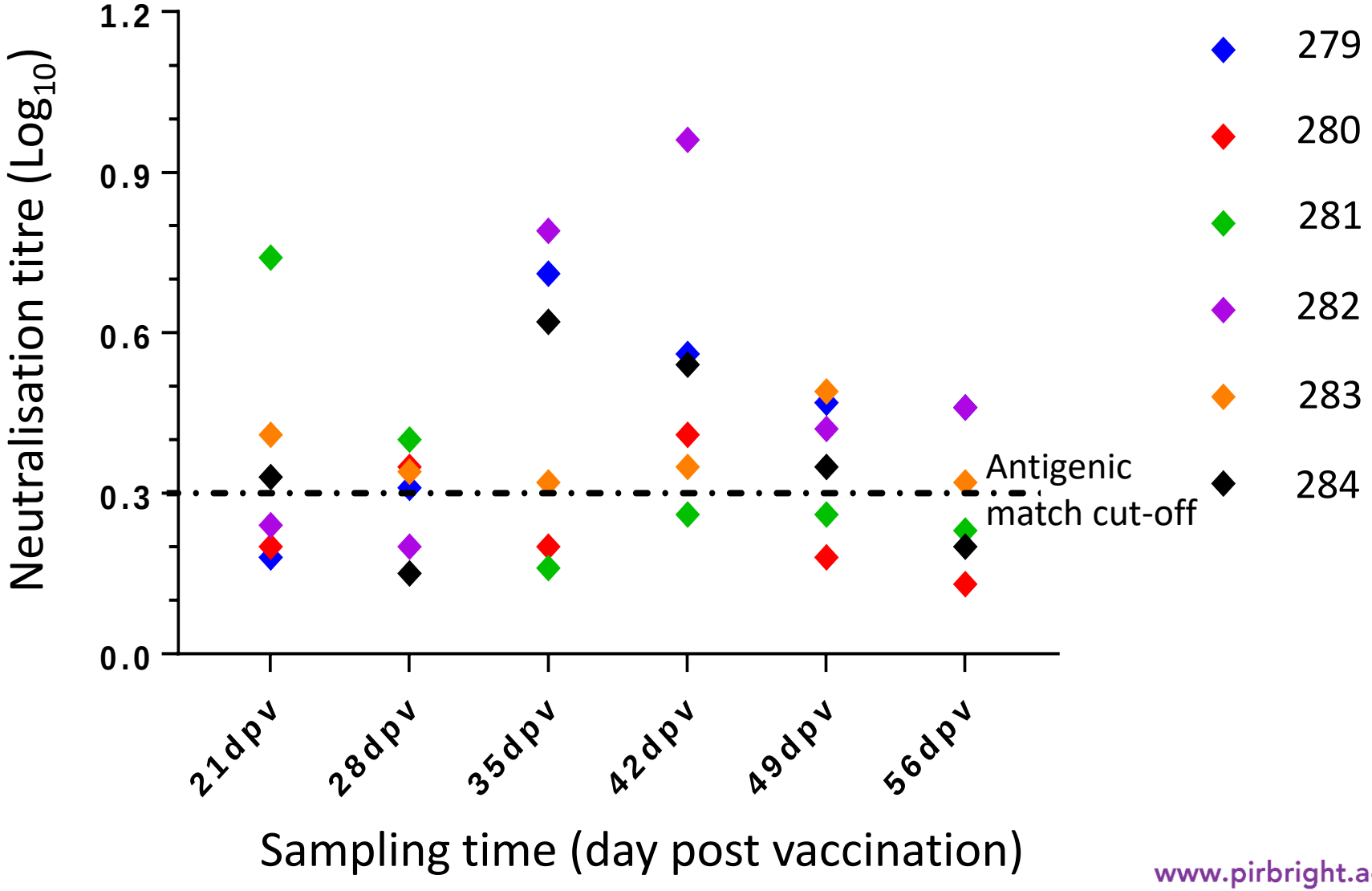
Results: Different sampling time & booster vaccination (Homologous Neutralisation titre)



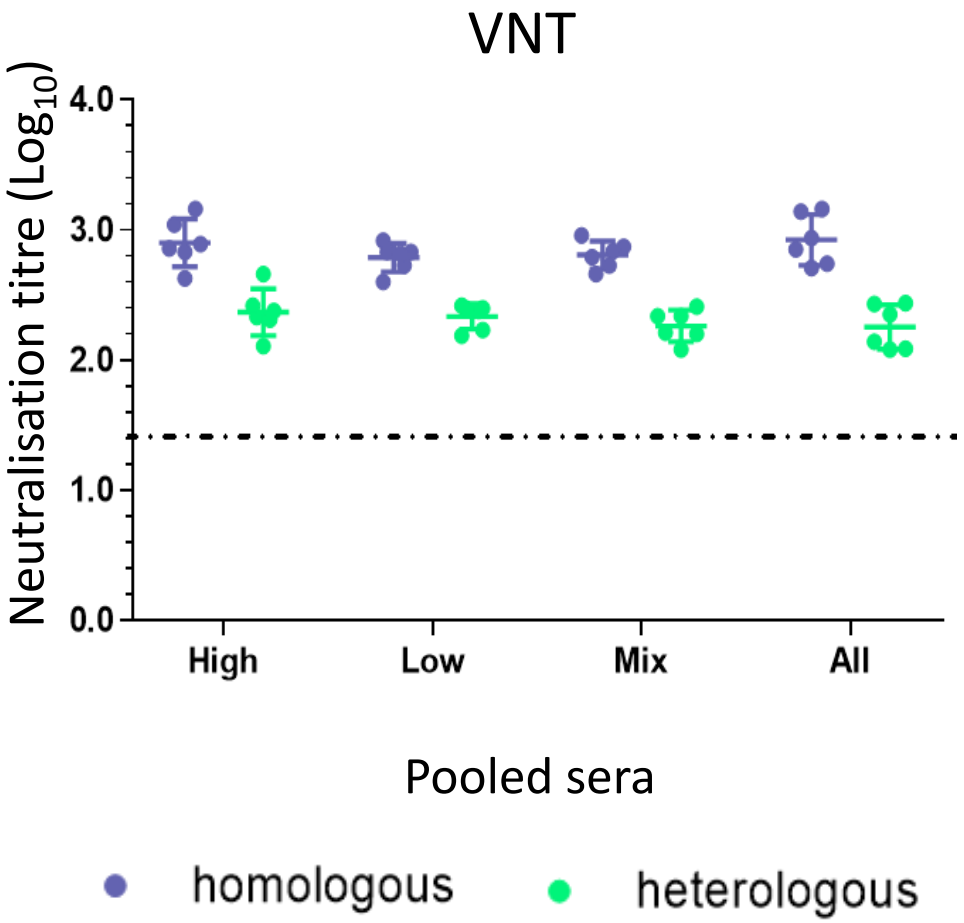
Results: Different sampling time & booster vaccination (Heterologous Neutralisation titre)

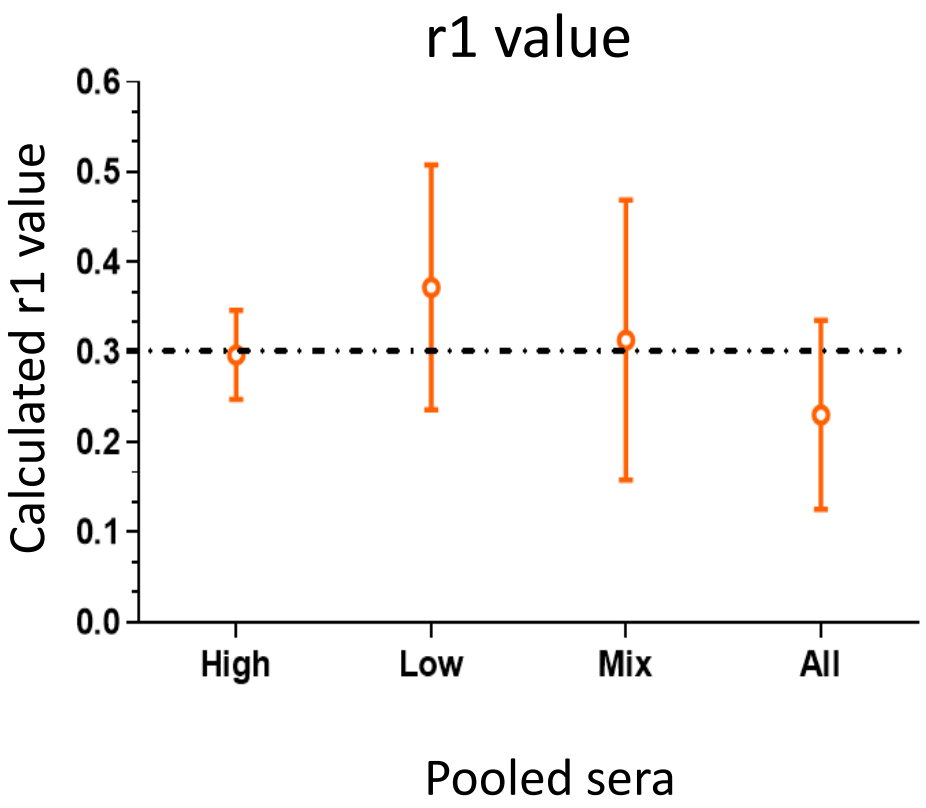


Results: Different sampling time and booster vaccination on r1-values

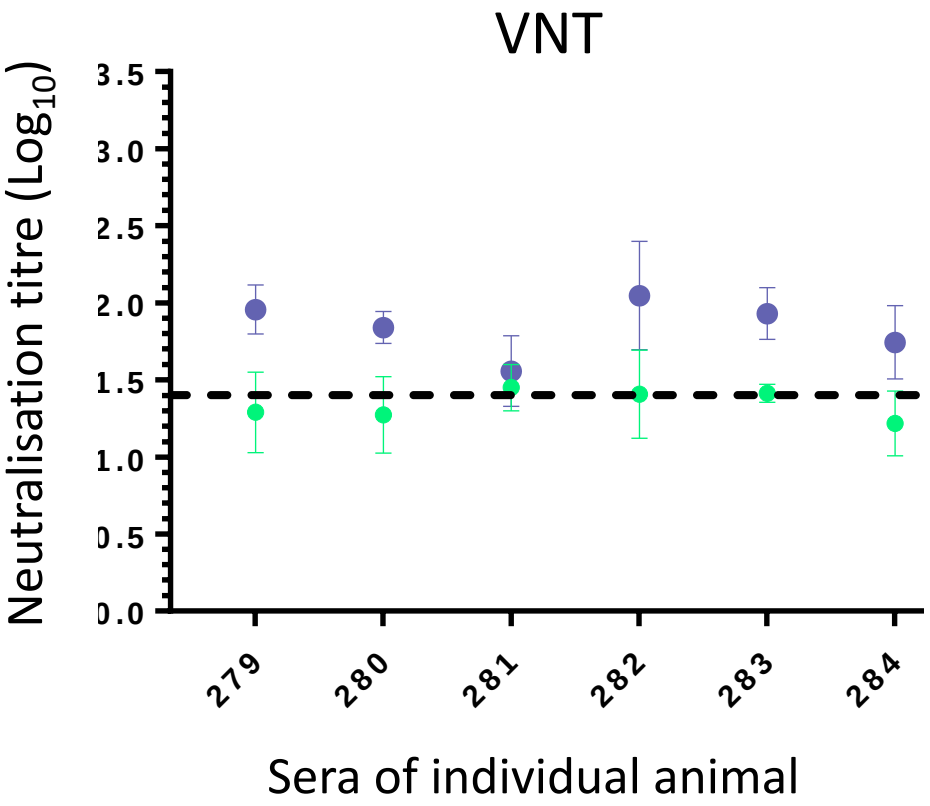


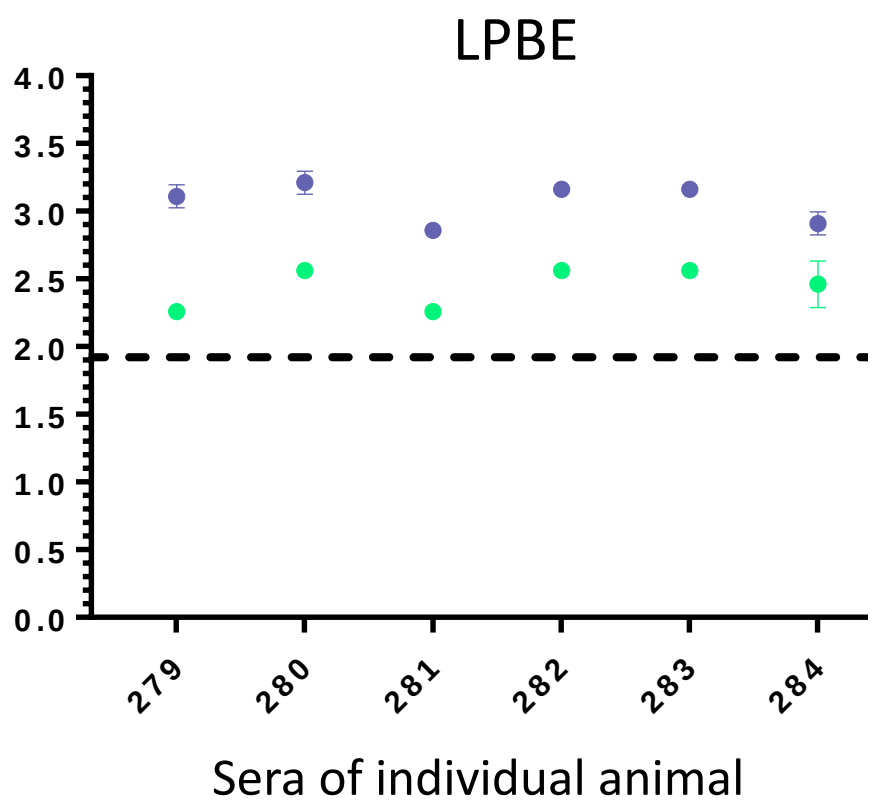
Results: Pooled 56dpv sera (neutralization titre & calculated r1 value)





Results: VNT vs LPBE at 21dpv





homologous heterologous

- Similar results showed by sera collected at 56dpv (booster).

Conclusion

- These findings highlight the importance of using standardised BVS to reduce variation of the *in-vitro* vaccine matching methods.
- LPBE is less variable than VNT
- Pooling sera reduces variability of VNT
- Inconsistent calculated r1-values were observed for all comparisons

Acknowledgements

- Colleague at SAU, WRL FMD Pirbright.
- Malaysian Government – Funding my study
- DTRA – Funding my travel expenses to attend this meeting