FMD

Boehringer Ingelheim
The Veterinary Public Health Center

Claude HAMERS, 26 Oct 2017

THE VPH CENTER
VETERINARY PUBLIC HEALTH

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A MALAYSIA-12 PROTECTION AGAINST VIRULENT CHALLENGE: AN EXAMPLE OF CLINICAL PROTECTION OF A VACCINE DESPITE LOW R1 VALUES

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Dr. Claude HAMERS
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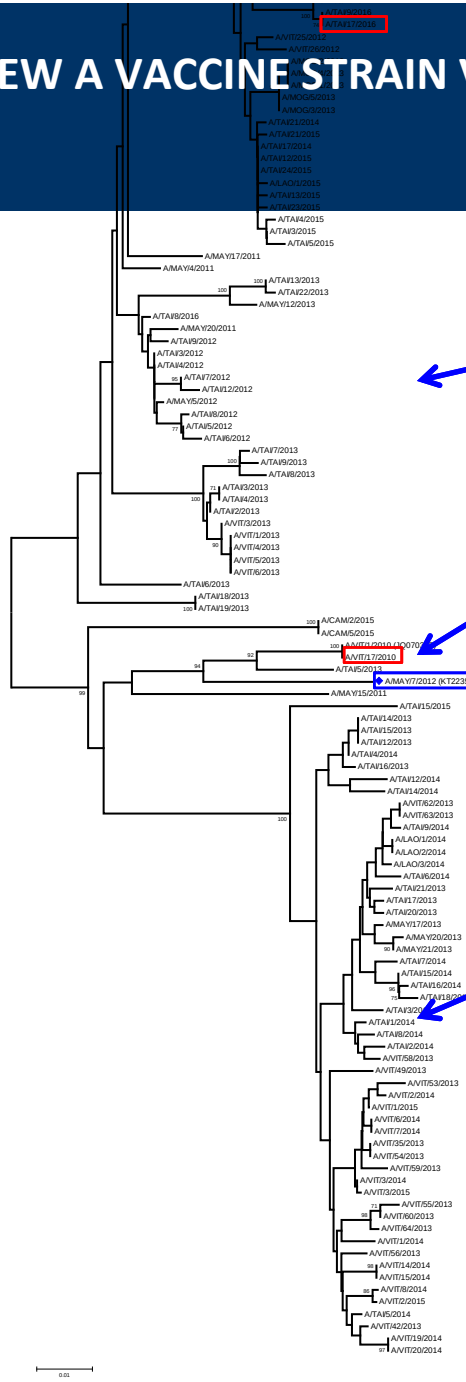
OUTLINE

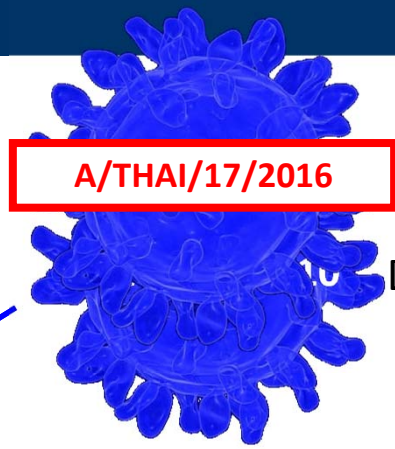
- ✓ **FMDV is highly variable**
  - ✓ Need for monitoring of the circulating FMD viruses
  - ✓ Need for vaccines having broad cross protection
  - ✓ Need for tool allowing assessment of vaccine matching
- ✓ **Vaccine matching r1 values**
  - ✓ 0.3 threshold
  - ✓ r1 is quite variable

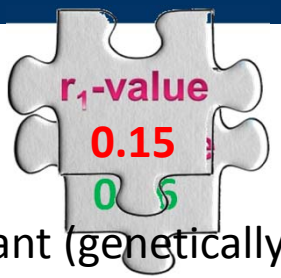
$$r_1 = \frac{Ab\ titre\ of\ serum\ against\ field\ isolate\ (heterologous)}{Ab\ titre\ of\ serum\ against\ vaccine\ strain\ (homologous)}$$

- ✓ **Example based on 2 PD_{50} studies**
- ✓ **Low r1-values and high potency vaccines**
  - ✓ r1-value is part of a puzzle

NEW A VACCINE STRAIN VS 2 DIFFERENT FIELD ISOLATES, *IN VIVO*

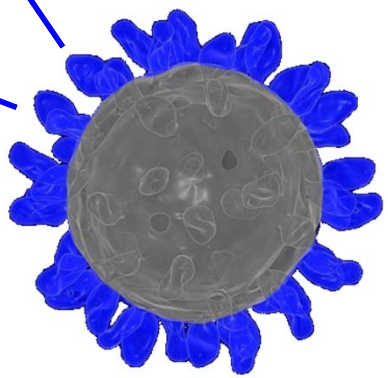






Distant (genetically and antigenically) and recent challenge strain

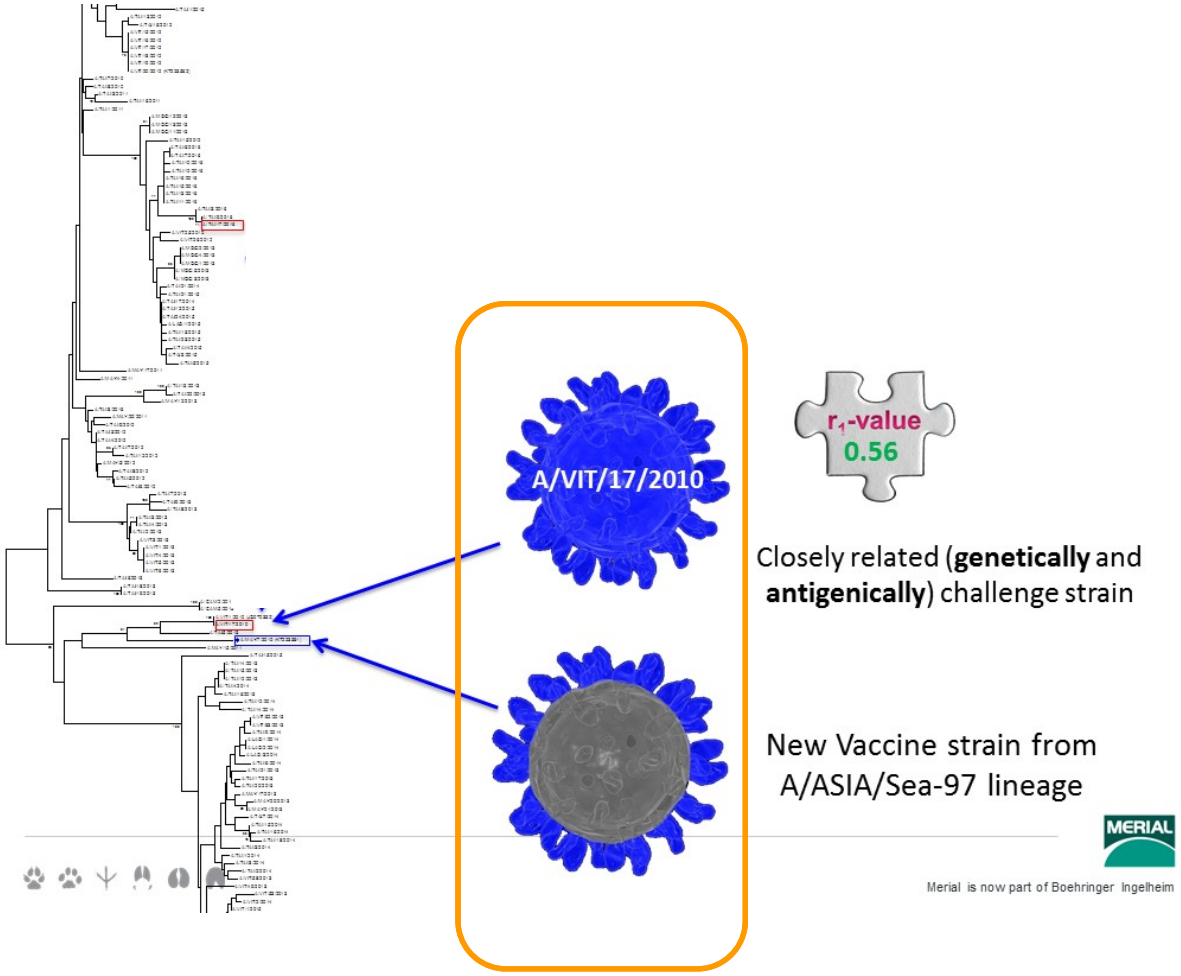
Closely related (genetically and antigenically) challenge strain



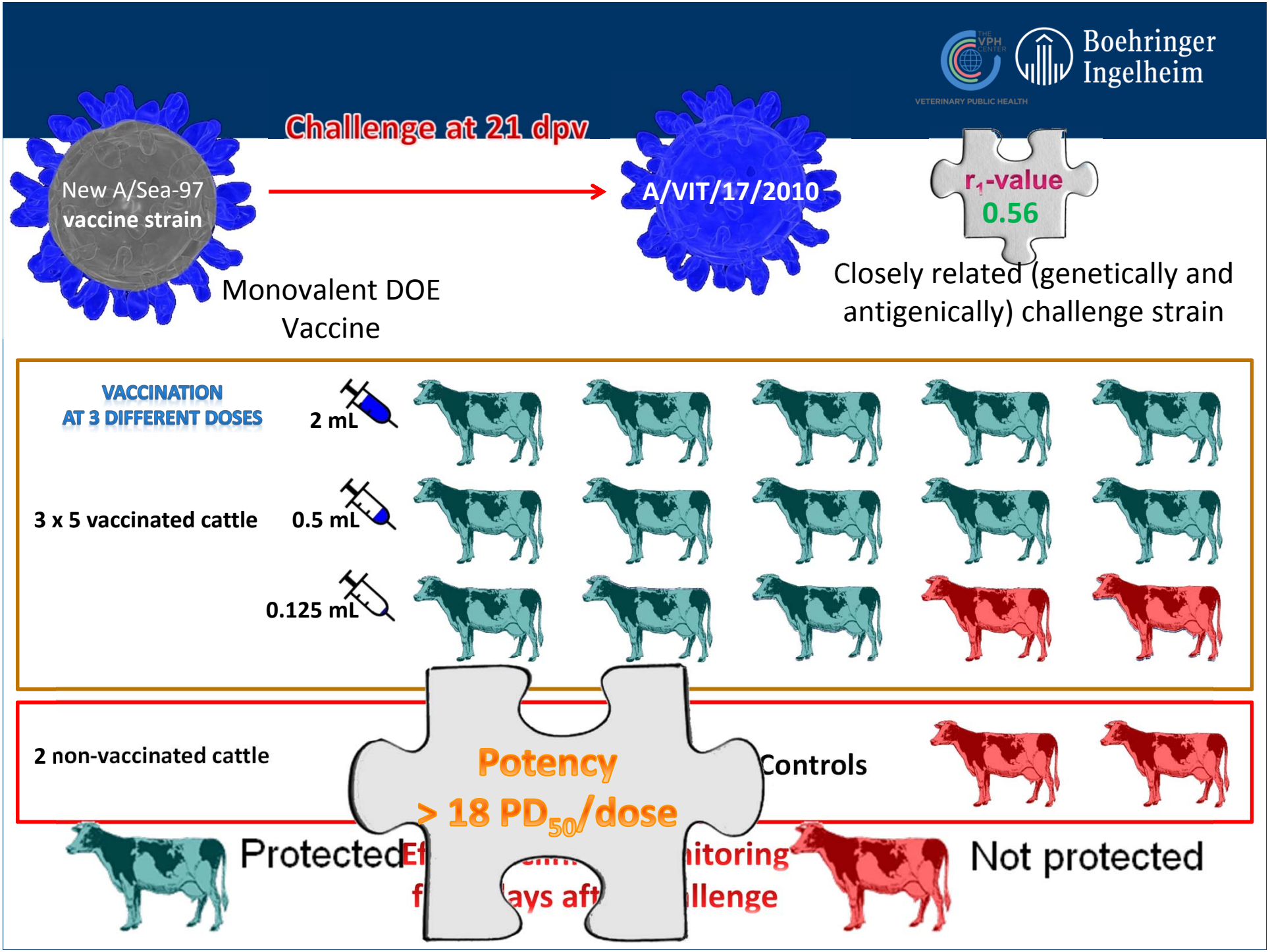
New Vaccine strain from A/ASIA/Sea-97 lineage, in monovalent DOE vaccine

PD_{50} STUDY N°1

in vivo study



Study performed at WBVR, The Netherlands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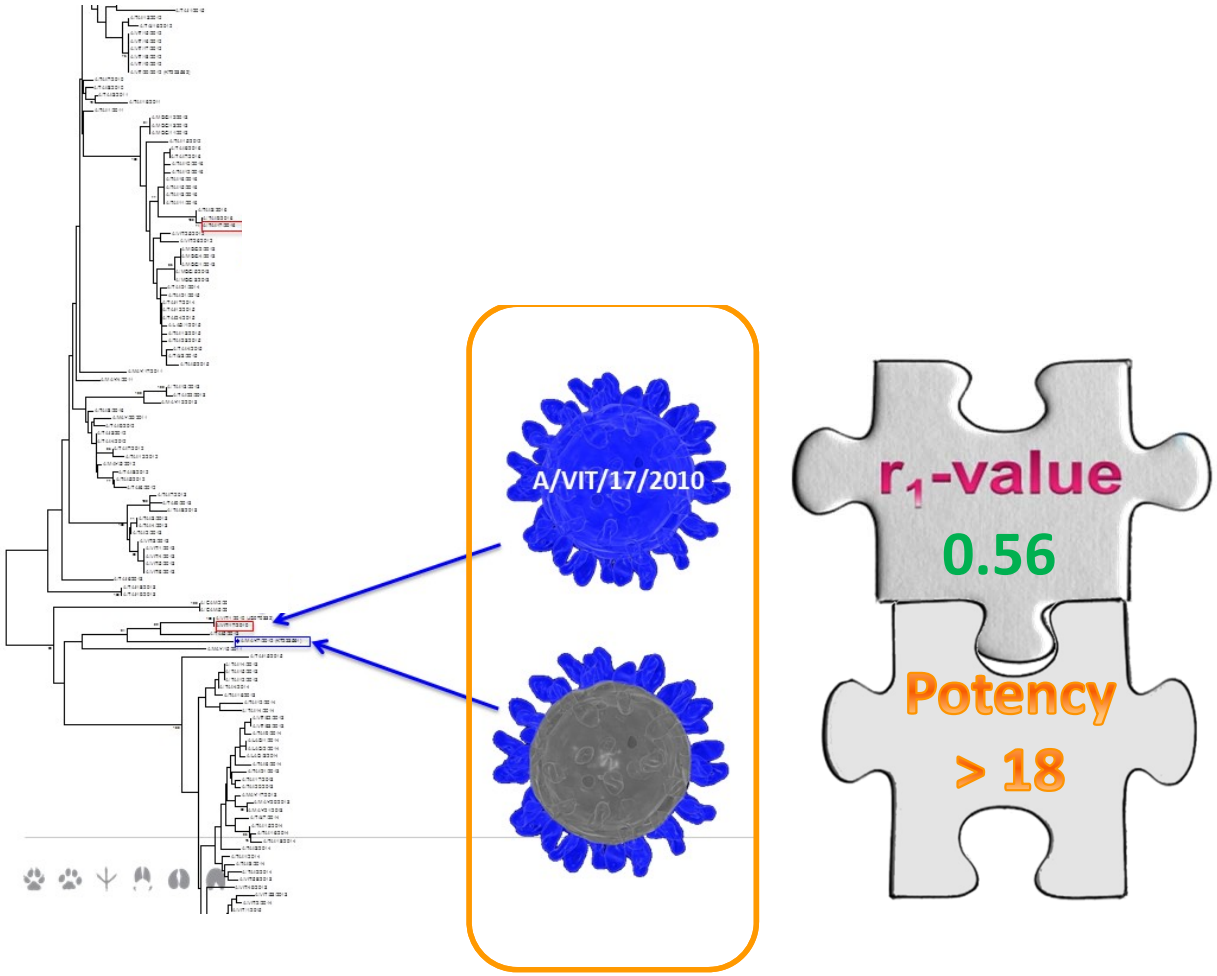
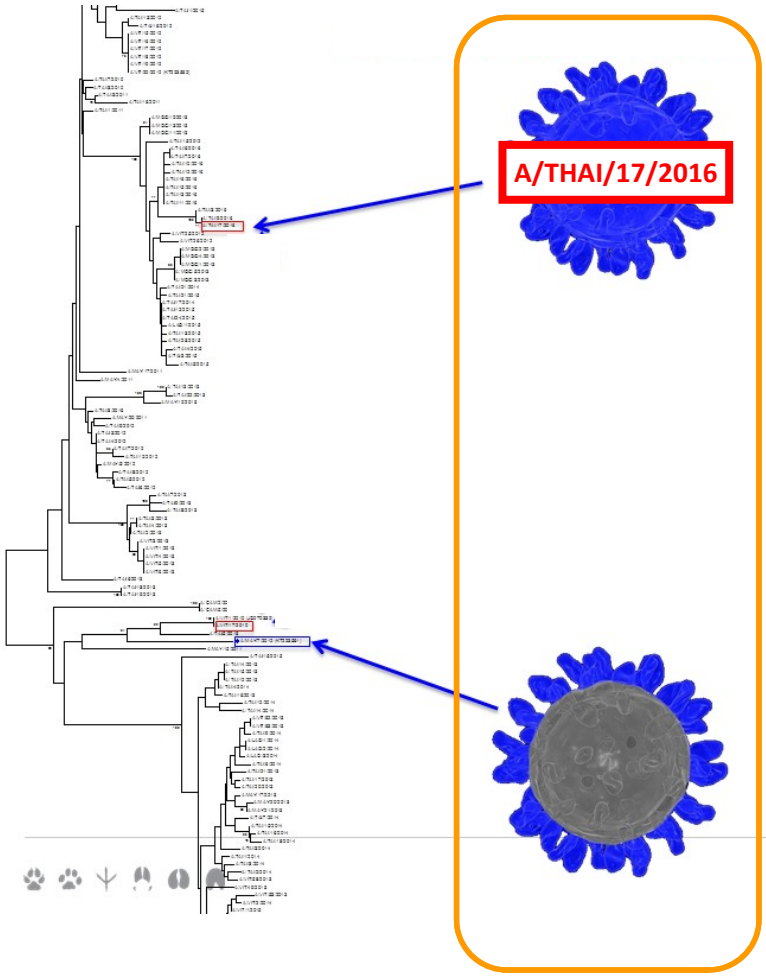
Challenge at 21 dpv
New A/Sea-97
vaccine strain
A/VIT/17/2010
r_1-value
0.56
Monovalent DOE
Vaccine
Closely related (genetically and antigenically) challenge strain
VACCINATION
AT 3 DIFFERENT DOSES
2 mL
3 x 5 vaccinated cattle
0.5 mL
0.125 mL
2 non-vaccinated cattle
Controls
Potency
> 18 PD50/dose
Protected
Not protected

CONCLUSION:
NEW « A » VACCINE STRAIN IS HIGHLY POTENT (>18 PD_{50}) AGAINST A CLOSELY RELATED ISOLATE



PD_{50} STUDY N°2

in vivo study



A/THAI/17/2016

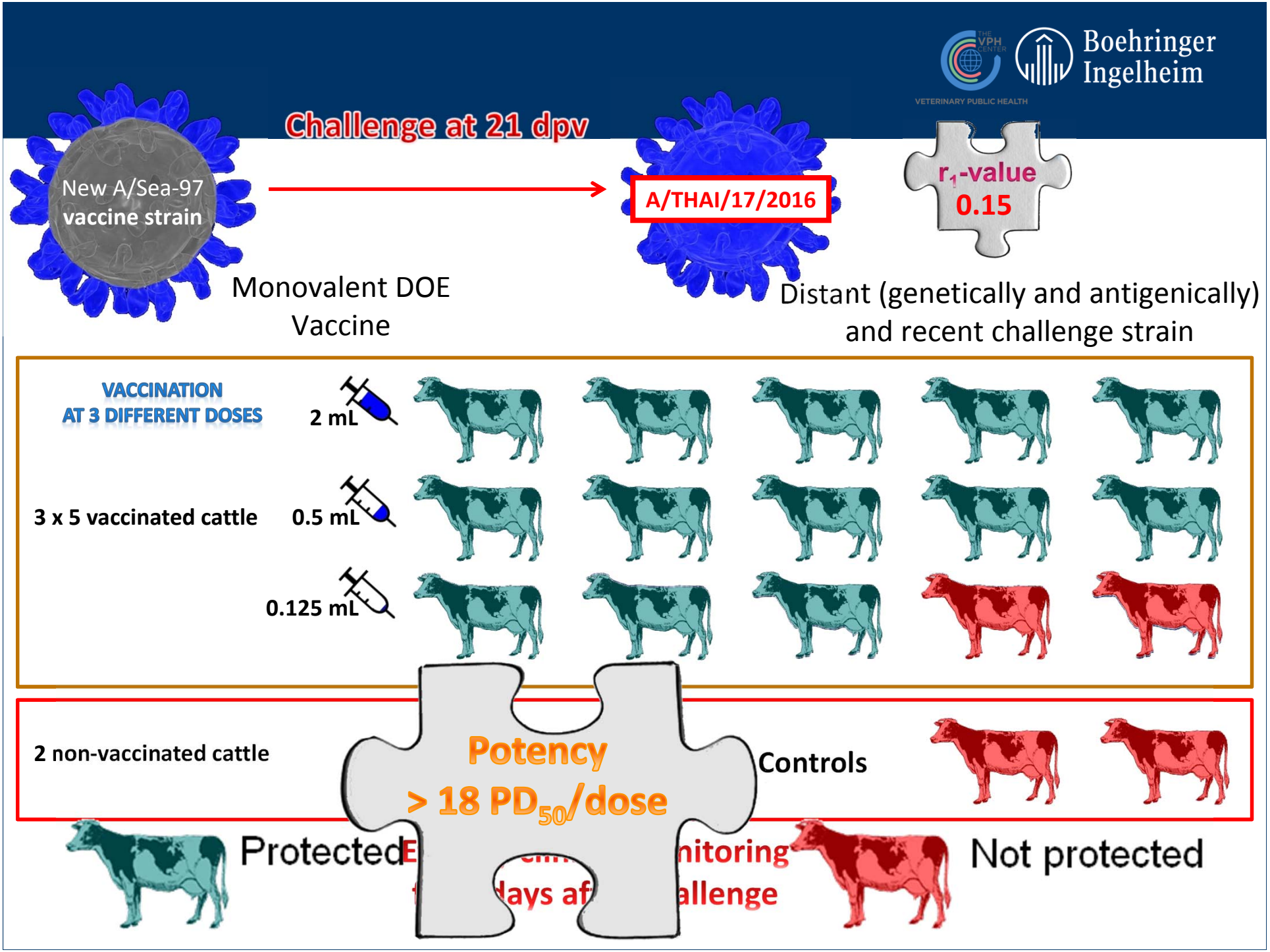
r_1-value 0.15

Distant (**genetically** and **antigenically**) and recent challenge strain

New Vaccine strain from A/ASIA/Sea-97 lineage

Merial is now part of Boehringer Ingelheim

Study performed at TPI, UK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2 mL
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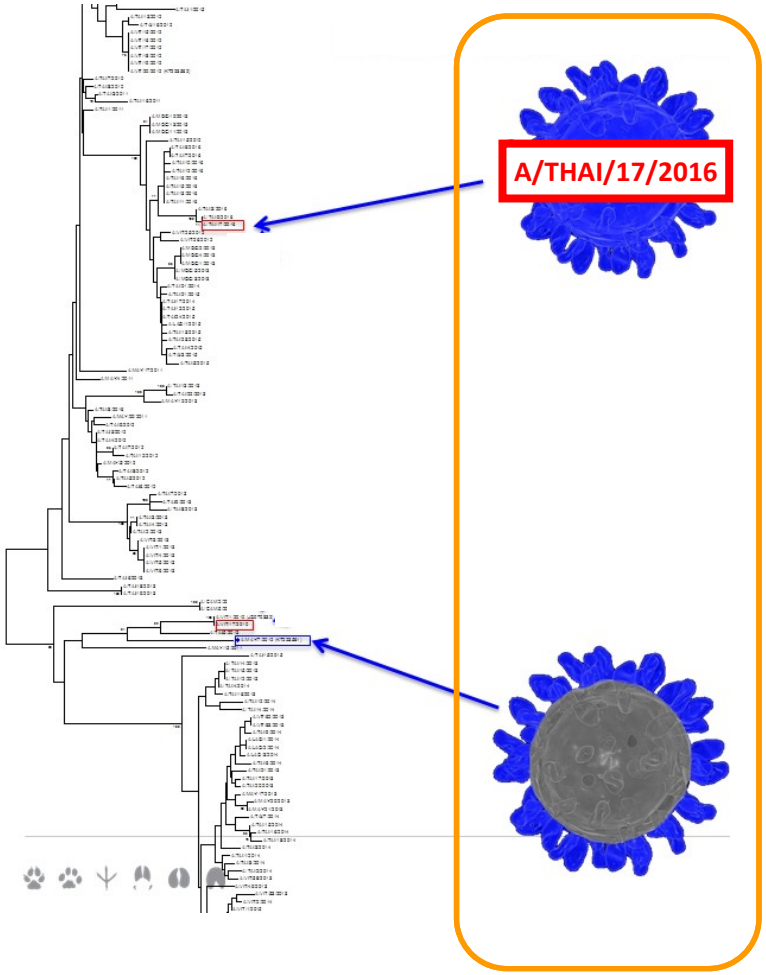
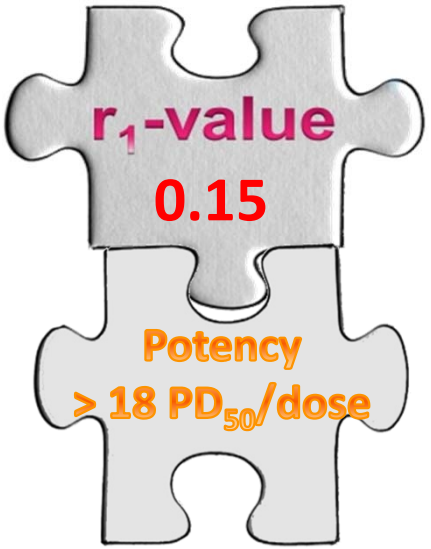
0.125 mL
3 x 5 vaccinated cattle
2 non-vaccinated cattle
Controls
Potency
> 18 PD_{50}/dose
Protected
Not protected

CONCLUSION:
NEW « A » VACCINE STRAIN IS HIGHLY POTENT (>18 PD_{50}) AGAINST A RECENT & GENETICALLY/ANTIGENICALLY DISTANT ISOLATE





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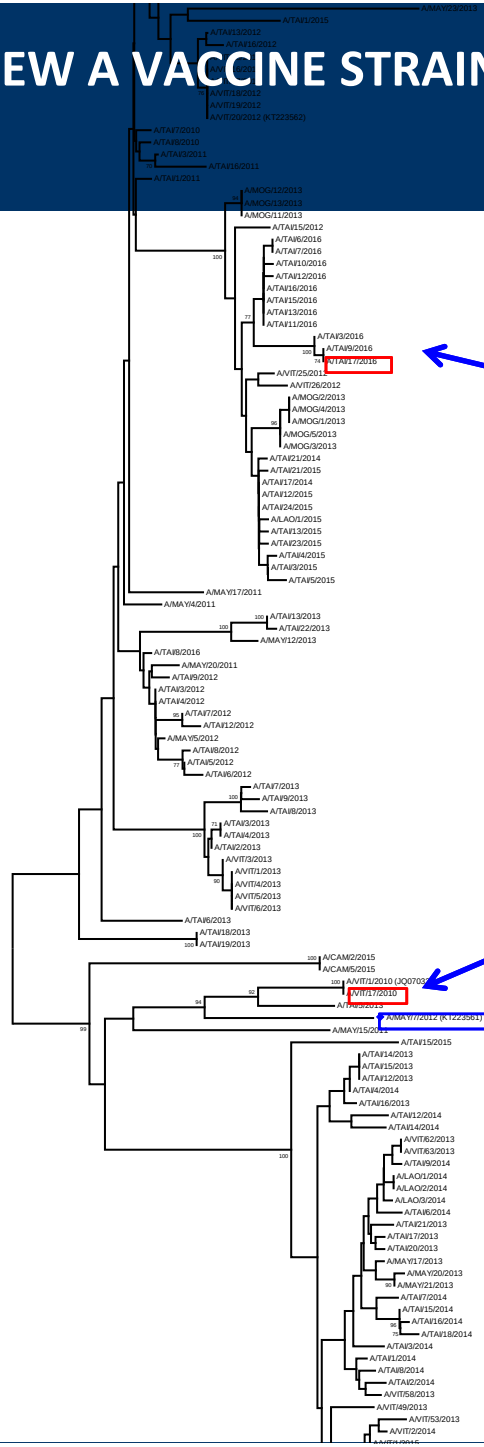
A/ASIA/Sea-97



A/THAI/17/2016

A/VIT/17/2010

r_1-value

0.15

Same Potency

r_1-value

0.56

TAKE HOME MESSAGES

- ✓ **Now widely acknowledged that high potency vaccines are able to protect against antigenically distant strains, even in case of low r1-values**
- ✓ **Need for more robust method to assess heterologous vaccine performance**
- ✓ **Need to educate stakeholders on strengths/limitations of r1-values**
- ✓ **Success of a vaccination campaign does not solely depend on the antigenic match:**
  - Potency of the vaccine
    - Antigen quality and payload
    - Formulation (adjuvants)
  - Deployment of the vaccine, cold chain etc
  - Vaccination coverage and vaccination regimes
  - Interval between vaccination and exposure (DoI)
  - Severity of the challenge
  - ……

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THANK YOU FOR YOUR ATTENTION

Introduction