

ESTIMATE OF CROSS-PROTECTION PROVIDED BY AN FMDV O-BFS VACCINE IN THE TUNISIAN EPIDEMIOLOGICAL CONTEXT

E. Brocchi¹, S. Sghaier², S. Grazioli¹, G. Pezzoni¹, M. Bugnetti¹

***1. Istituto Zooprofilattico Sperimentale della Lombardia e dell'Emilia
Romagna (IZSLER), Brescia, Italy***

2. Institut de la Recherche Vétérinaire de Tunisie, Tunis, Tunisia

EXPERIMENTAL DESIGN

VACCINATION

TWO GROUPS OF ANIMALS NOT EXPOSED TO FMDV INFECTION RECEIVED A **SINGLE VACCINATION** WITH THE VACCINE **STRAIN O-BFS** (POOR IN-VITRO MATCHING WITH THE FIELD VIRUS)

- **GROUP 1.** n.13 **cattle** + N. 29 **sheep** – **never vaccinated (NAIVE)**
- **GROUP 2.** n. 40 **cattle** + n. 40 **sheep** – **previously vaccinated** with the Tunisian vaccine (O Manisa+O Tunisia 99) (5 cattle and 4 sheep sentinel)

SAMPLING SCHEME

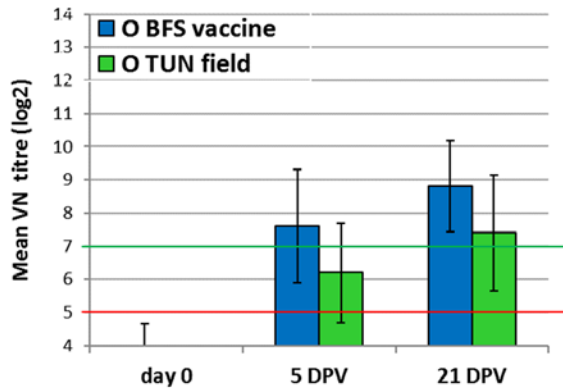
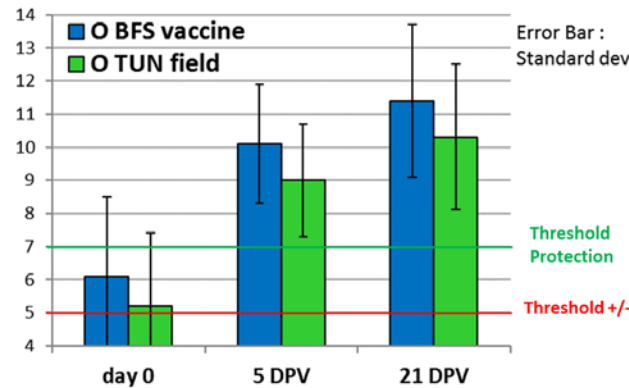
- Before vaccination (**Day 0**)
- 5 days post vaccination (**5 DPV**) : evaluation of early immune-response to vaccine
- 21 days post-vaccination (**21 DPV**) : standard time to assess vaccine-induced immune response

TESTING SCHEME

Parallel titration of sera by **Virus Neutralization Test (VNT)** against:

- the vaccine strain O-BFS (homologous)
- the Tunisian circulating virus (heterologous)

Concept: virus neutralizing antibodies are able to inactivate virus infectivity and can be interpreted as estimate of protection.

MEAN VIRUS NEUTRALIZING TITRES (log₂)SINGLE VACCINATION (O-BFS)
n. 29 SHEEPBOOSTER VACCINATION O-BFS
n. 36 SHEEPSIMILAR PATTERN
IN CATTLE AND SHEEP

Homologous (O-BFS) mean titre 1 log₂ (2-fold) > heterologous (O Tunisia '14)

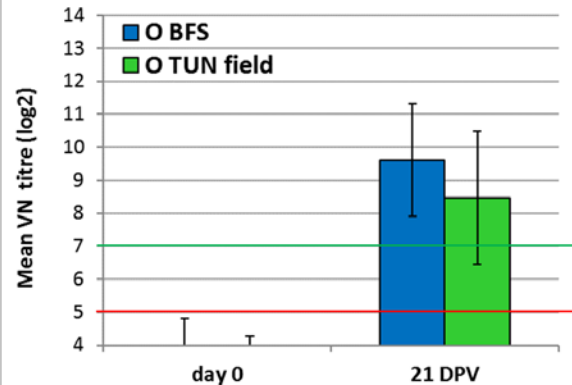
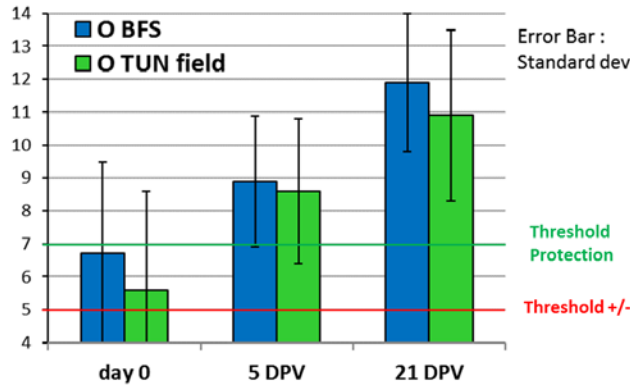
SINGLE VACCINATION O-BFS

✓ 21 DPV the mean titres towards the field virus > log₂ 7 (1/128), estimated threshold for protection

✓ However, approximately 15% animals did not achieve a protective immunity against the field Tunisian virus

BOOSTER VACCINATION O-BFS

✓ In the vaccinated population a booster vaccination with O-BFS elicited a protective immune-response as soon as 5 DPV

SINGLE VACCINATION (O-BFS)
n. 13 CATTLEBOOSTER VACCINATION O-BFS
n. 35 CATTLE

CONCLUSION

In the Tunisian epidemiological context and considering the heterogeneity of the population immune status:

- A single vaccination with the heterologous vaccine O-BFS may not be sufficient to confer adequate and long-lasting protection in the naïve population;
- However, a booster vaccination with O-BFS vaccine elicited a strong and fast (5 DPV) increase of antibodies cross-neutralizing the field circulating virus, despite the limited antigenic matching between the two strains;
- Therefore, the vaccination with the heterologous FMDV O-BFS is expected to induce a good immunity, when administered to animals previously vaccinated, irrespective the vaccine strain(s).

THANK YOU