Foot-and-mouth disease in Nigeria

presented by David Lefebvre (Sciensano, Belgium)
in collaboration with
the National Veterinary Research Institute (Nigeria)
and the Plum Island Animal Disease Center (ARS/USDA, USA)

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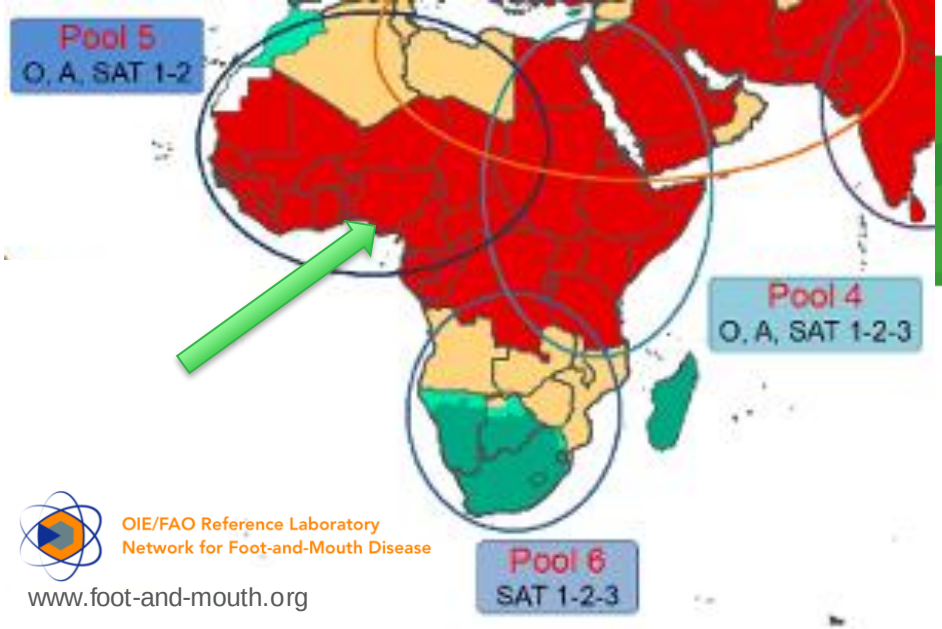

Nigeria

- 924.000 km^2
- 190 million people
- Largest African economy
- Exportation of oil and gas

- Subsistence-oriented agriculture – 20 million cattle, 40 million sheep, 70 million goats, 7 million pigs – demand largely exceeds production
- Significant movement of livestock across the borders and inside the country due to importation and nomadic pastoralism
- No systematic surveillance for FMD, only sporadic notifications
- No control program for FMD, vaccines not locally available

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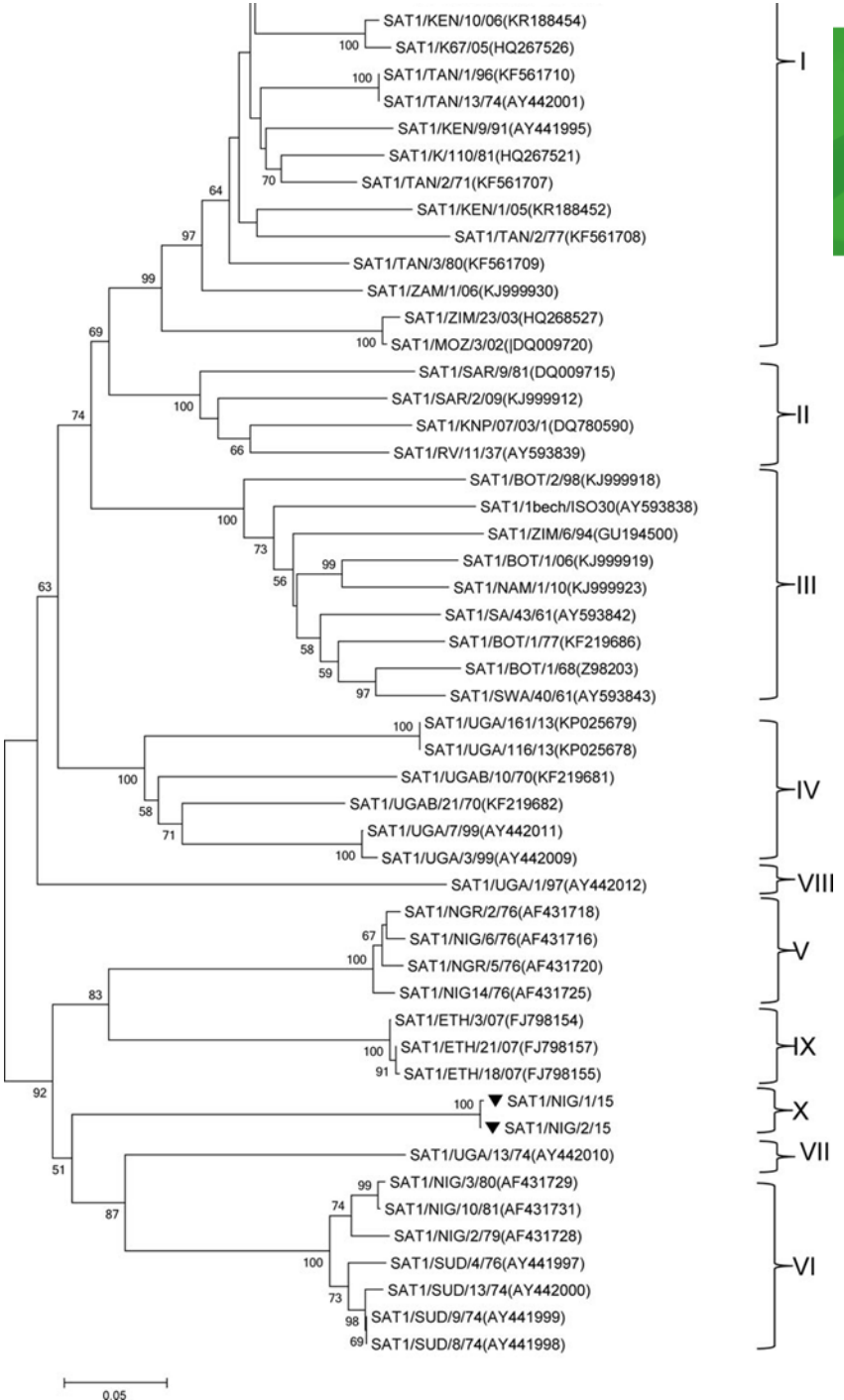
Previous results of the OIE Laboratory Twinning program for capacity building

- Detection of FMD virus in 4 provinces of Northern Nigeria during the period 2012-2015: **O/WA, O/EA-3, A/Africa/G-IV, SAT1/X, SAT2/VII**

  (Ehizibolo, Haegeman et al., 2017a, Transbound Emerg Dis)

- Epidemiology: complex and highly dynamic

- Most prevalent serotype in Plateau State:
- 2013: SAT2/VII
- 2014: O/EA-3
- 2015: A/Africa/G-IV
- From end 2015: SAT1/X



Identification of a new topotype: SAT1/X

	% NT homology	% AA homology
Topotype V		
SAT1/NGR/2/76	71	79
SAT1/NGR/5/76	70	79
SAT1/NIG/6/76	71	79
SAT1/NIG/14/76	71	79
Topotype VI		
SAT1/NIG/2/79	71	78
SAT1/NIG/3/80	71	76
SAT1/NIG/10/81	71	78

- Ehizibolo, Haegeman et al., 2017b, Transbound Emerg Dis
- Vandenbussche et al., 2017, Genome Announc

Studies during the period 2016-2018: epithelial samples

- Epithelial samples from suspected FMD-infected cattle were collected in Northern and South-West Nigeria
  - 2016: 45 samples from 3 States and 3 archived samples from 2014 were analyzed in PIADC
  - 2017: 44 samples from 7 States were analyzed in Sciensano
  - 33 archived samples (2012 and 2014) from the Kachia Grazing Reserve (KGR) were analyzed in Sciensano

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Studies during the period 2016-2018: serum samples

- Archived serum samples were analyzed in Sciensano
  - Serosurveys:
    - 300 samples from sheep and goat (2014)
    - 38 samples from wildlife (2009 – end 2014)
    - 1220 samples from cattle and 160 samples from sheep from KGR (2012)
  - FMD outbreaks:
    - 59 samples from diseased cattle from KGR (2012 – 2014)

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Results from epithelial samples

- Samples from 2014 (3) and 2016 (45):

  O/WA, O/EA-3, A/Africa/G-IV, SAT1/X, SAT2/VII

- Samples from 2017 (44):
  - O/EA-3, A/Africa/G-IV, SAT2/VII
  - In a single State outbreaks with 2 or 3 different serotypes observed in only 2 or 3 months of time
  - A single serotype isolated at the same time in remote States
- Samples from KGR (33):
  - 2012: SAT2/VII
  - 2014: O/EA-3

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Results from serum samples

- Serosurveys:
  - Lower prevalence of antibodies against FMDV in small ruminants compared to cattle and wildlife
    - 16.3 – 21.7% vs. 30.6 – 44.7%
  - Most small ruminants are seropositive for a single serotype while more wildlife and cattle are seropositive for 2 or more serotypes
    - 72.3% mono-specificity vs. 46.7 – 58.0%
  - Until 2014 serological evidence for circulation of O, A and SAT2
- FMD outbreaks in Kachia Grazing Reserve:
  - Until 2012 serological evidence for circulation of O and A
  - Since 2012 outbreaks also serological evidence for SAT2

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Discussion

- No isolation of O/WA and SAT1/X in 2017
  - Outcompeted by O/EA-3, A/Africa/G-IV and SAT2/VII?
  - No access to samples from States in which these topotypes are circulating?
- No evidence for circulation of SAT1/X in Nigeria until at least 2014
  - Assumption of a new introduction into Nigeria in 2015 still stands
  - No data available from neighboring countries, particularly Niger and Chad, that act as an access road for the importation of live animals
- Lower prevalence of FMD in small ruminants, even at household level
  - Less susceptible to infection with FMD virus?
  - Lower and thus less detectable antibody levels?
  - Younger age structure of the herd due to larger number of offspring?

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- **Thank you for your attention!**

- **Any questions or remarks?**

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