FMD Week2010

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FMD VIRUS SITUATION IN NIGERIA

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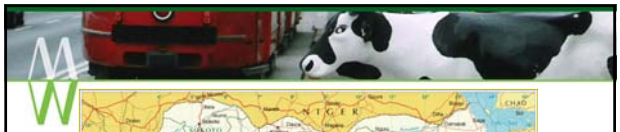
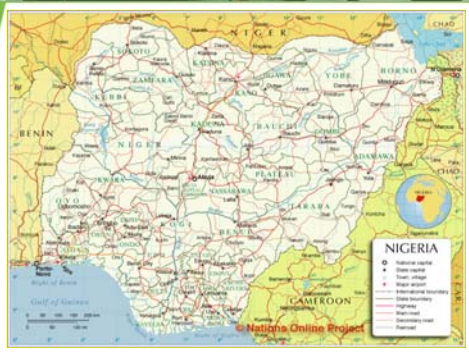
- Nigeria has a tropical climate with sharp regional variance depending on rainfall.
- Temperatures are high throughout the year, 25-28°C (77-82°F).
- Northern Nigeria experiences greater temperature extremes than the south.
- Population: 138,283,240 (2008 estimate).
- Urban: 48%
- Rural: 52%

- Cattle population: 15,239,647 (WAHID, 2008) aside the countless heads of cattle that cross into the country daily.
- Agriculture accounts for 23% GDP.
- Agriculture has contributed to >75% of the national export earnings before 1970.
- Livestock sector: dominated by Fulani Pastoralists.
- In 1983, the industry was devastated by the rinderpest outbreak.





INTRODUCTION Contd.

- First reported outbreak in 1920, untyped; 1924,serotype O.
- Thereafter; A, SAT1 and SAT 2.
- Nigeria shares land borders with Republic of Benin, Chad & Cameroon and Niger.
- The country serves as a meeting point for most of the cattle arriving from West & Central African countries in view of the abundant feed resources, enormous population (1/5 African population) and relative wealth/purchasing power in the sub-region.

INTRODUCTION Contd.

- It should be understood that transhumance production is the predominant system of management in sub-Saharan Africa.
- Many of these individuals traverse national borders without any recourse to quarantine and control measures.
- Over the years, there has been no coordinated national control policy.

INTRODUCTION Contd.

- No surveillance activities on ground.
- No full cost implication of FMD.
- The role of wildlife and carrier animals in the epidemiology of FMD in Nigeria is still unclear.
- Research reports has always been regionalised and fragmented.
- In 2007, we started the collection of samples from outbreak cases.

INTRODUCTION Contd.

- This is in order to determine the circulating serotypes in the country.
- In the meantime, we are collecting samples across the country for typing and molecular studies.
- This is to recommend a national control strategy for implementation.

MATERIALS AND METHODS

- Nigeria is divided into three agro-ecological zones.
  - . Forests
  - . Savannahs
  - . Montane land
- FMD surveillance in Nigeria is undertaken by NADIS and NVRI.
- During 2007-2009, areas that reported outbreaks were visited.
- Team of experts were dispatched to conduct a disease investigation.

MATERIALS AND METHODS

- Within the period under review, 10 outbreak cases were reported to the NVRI Vom.
- Samples were collected.
- Epithelial tissues, oral swabs and vesicular lesions from clinically sick animals were collected.
- The samples were transported to the laboratory in virus transport media on ice.

MATERIALS AND METHODS

- In the laboratory samples were processed and packaged according to International standard for the transportation of infectious materials affecting animals (UN2900).
- The samples were sent to the WRLFMD, IAH Pirbright, UK for confirmatory diagnosis and serotyping.
- Other samples collected by a postgraduate student were sent to PIADC-FADDL for confirmatory diagnosis and serotyping as well.

MATERIALS AND METHODS

- Virus was isolated in primary bovine thyroid cell culture and serotyped using antigen capture ELISA, and molecular analyses were performed at the WRL according to standard procedures.

RESULTS

- 48 samples tested positive for FMD; 36 were typed while the rest 12 were positive at PCR with no virus detected in cell culture.
- Sero-typing 36 (75.0%) sero-positive samples; O (4.2%), A (52.1%) and SAT 2 (18.7%).
- No SAT 1 was recovered from the recent outbreaks.
- From the 30 tissues submitted to PIADC-FADDL, 21/30 (70%) were positive and typed as serotype A.
- Phylogenetic analysis of the PI and the VPI regions revealed close identity to A21 Kenya 1984 virus and Cameroon 2000 virus respectively.

RESULTS

- In Nigeria, both serotypes O, A and SAT 2 co-circulated between 2007 and 2009.
- Sequence analyses indicated that the serotype O that occurred in 2007/2008 as well as the 2009 are closely related to the Sudan 2004 and 2005 isolates respectively.
- Similarly, the SAT 2 viruses were closely related to Sudan 2007 and Niger Republic 2005 outbreaks.

SAMPLE DISTRIBUTION

	SAMPLE PER ZONE (%)	SAMPLE +VE PER ZONE (%)	SAMPLE –VE PER ZONE (%)
NORTH CENTRAL	55 (59.8)	33 (60.0)	22 (40.0)
NORTH EAST	21 (22.8)	10 (47.6)	11 (52.4)
SOUTH WEST	16 (17.4)	5 (31.3)	11 (68.7)

REGIONS/DISTRICTS WHERE SAMPLES WERE COLLECTED

ZONE	DISTRICT
NORTH CENTRAL	MINNA, JOS, BUKURU, BARIKIN-LADI, VOM, SHENDAM
NORTH EAST	BAUCHI, NABORDO, TAFAWA BALEWA, YOLA
SOUTH WEST	ABEOKUTA, IBADAN, EKITI

PROPORTION OF SEROTYPE POSITIVE BY ZONE 2007-2009

ZONE	OVERALL	O	A	SAT 2	NVD
NORTH CENTRAL	33/55 (60.0%)	1/33 (3.0%)	22/33 (66.7%)	8/33 (24.2%)	2/33 (6.1%)
NORTH EAST	10/21 (47.6%)	2/10 (20.0%)	3/10 (30.0%)	1/10 (10.0%)	4/10 (40.0%)
SOUTH WEST	5/16 (31.3%)	0/5 (0.0%)	0/5 (0.0%)	0/5 (0.0%)	5/5 (100.0%)

SUMMARY OF OUTBREAKS

PERIOD	NUMBER OF REPORTED OUTBREAK
2007	1
2008	4
2009	5
TOTAL	10

DISCUSSION

- Nigeria is one among the least countries sampled for FMD.
- Very little efforts have been made in time past to control FMD in Nigeria.
- However, FMD still continues to gain importance as livestock farming becomes more intensive in the global fight against food security.
- The serotypes O, A and SAT 2 isolated from Nigeria were from locations along the nomadic trade routes.

DISCUSSION

- These locations serve as exchange points of shared infections as the vegetation is good for livestock husbandry.
- As majority of these animals are rarely sedentary, the location of isolation may significantly differ from the point of infection.
- From this study, genetic sequences have confirmed high degree of relatedness.

DISCUSSION

- Samples collected in 2007 and 2008 were submitted to the WRLFMD for the first time in many years, resulting in the identification of serotypes O and SAT 2.
- Interestingly, isolates of both serotypes were genetically closest to previously characterised isolates from Sudan (pool 4) obtained between 2005-07.
- More studies are required to define the relationships between viruses of pool 4 and 5.

DISCUSSION

- FMDV types O and A were isolated from samples in 2009.
- A single type O virus belonged to the EA-3 topotype and was most closely related to viruses of 2007 and Sudan (2004-08).
- Eight type A viruses belonged to the AFRICA topotype (lineage G-I), but fell into two distinct sub-lineages, one of which clustered with Kenyan viruses.
- Four type A viruses all belonged to the AFRICA topotype G-IV lineage but fell into two distinct sub-lineages.
- Our analyses revealed a pattern of FMDV serotypes that traverses beyond boundary of Nigeria.
- It is thus necessary to carry out a comprehensive assessment of the recent FMD situation in Nigeria.

SUMMARY OF REPORTED OUTBREAKS IN NIGERIA

YEAR OF OUTBREAK	SEROTYPE IDENTIFIED
1920	untyped
1924	O
1961	A
1962	A
1963	SAT 1, SAT 2, O
1964	SAT 1, A
1965	A
1966	A
1967	A
1968	SAT 1, A
1970	SAT 1, A
1971	A

REPORTED OUTBREAKS

1972	SAT 1, A
1973	SAT 1, SAT 2
1974	SAT 2, A
1975	SAT 1, SAT 2, A
1976	SAT 1, A
1979	SAT 1, A
1980	SAT 1
1981	SAT 1, SAT 2
1982	SAT 2
2007	O, SAT 2
2008	SAT 2
2009	O, A

Source :**WRLFMD, TADP OVI, FAO,OIE.**

DISCUSSION

- Successful control of FMD in Nigeria relies strictly on quarantine and movement control at the border states and vaccinations.
- Though vaccines have limitations;
  - .Custom made vaccines
  - .Cold chain
  - .Cost
  - . Incorrect application

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THANK YOU FOR LISTENING!