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An outbreak of African Swine Fever (ASF) in Delta State Polytechnic Piggery Farm, Ozoro, Nigeria

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ABSTRACT: This paper reports an outbreak of African Swine Fever (ASF) in Delta State Polytechnic piggery farm, Ozoro, Nigeria. The infection, post mortem and laboratory reports confirmed the incidence of ASF. A mortality rate of 95.22% was recorded, while a diagnosis of acute ASF was based on gross lesions and histopathology. Since there is no vaccine and effective treatment against ASF, it is recommended that pig farms should be adequately funded and adhere to standard Management procedure (sanitary and veterinary rules in daily operations) to avoid its introduction and spread.

Keywords: Epidemiology, African Swine Fever, Infection, Prevention, Sanitary, Mortality

Introduction

The African Swine Fever (ASF) is an expanding devastating viral disease currently threatening the pig industry worldwide (Ayoade and Adeyemi, 2003). The virus is an icosahedral cytoplasmic deoxyribovirus (ICDV) of the *Asfarviridae* family. It is an arbovirus (transmitted by ticks) and it is the only arbovirus that contains DNA. Wild Suids of Africa, mainly the warthog and bush pig, are the original vertebrate hosts of ASF. Domestic pigs are infected by ticks (*Ornithodoros moubata*) or by direct contact with wild suids. Transtadial and transovarian infections occur in ticks.

The first published description of the disease was presented by Montgomery in 1921 and was based on observations made in Kenya between 1909 and 1915 in domestic pigs (Hess, 1981). ASF was soon afterwards reported in South Africa, Angola (Riveyemamu, 2000) and in a large number of countries in Africa, south of the Sahara, either as an enzootic disease or as sporadic epidemics in domestic pigs (Aiello *et al*, 1998).

As at 1989, ASF has not been reported in Nigeria (Abdulkadir, 1989). Since 1996, ASF has reached serious proportions in West Africa, with outbreaks in Cote d'Ivoire (1996), Benin (1997), Togo (1997), Nigeria (1997) and Ghana (1999). Outbreaks of ASF were reported in Nigeria around the city of Lagos between mid 1997 and early 1998 (Oyekunle *et al*, 2007). Some other recent report and work on ASF in Nigeria include those of Odemuyiwa *et al*, (2000), Ayoade and Adehemi (2003), Otesile *et al*, (2005), Antiabong *et al*, (2006) and Oyekunle *et al*, (2007).

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The emergence of the disease in this farm has had serious economic implications, particularly as there is no vaccine and no treatment. The extremely high potential for transboundary spread of ASF poses a real risk to affected and unaffected piggery unit in the area. It is believed that this report will help the management in livestock production to better understand and take appropriate action in a case of another outbreak or incidence of ASF.

Materials and Methods

Study Site

This study was carried out at the piggery unit of the Delta State Polytechnic farm, Ozoro, Nigeria, to determine cause of mortality in the farm. It is located on latitude 5°45'N and longitude 5°40' and 6°E on the Greenwich meridian. The area has an annual rainfall of between 2500 – 3000mm and means temperature at the piggery unit was 27.4°C with range of 25°C to 30°C all through the period of the study.

Experimental Procedure

Clinical observation were made on pigs on gery where there was a report of sudden death on the 16th August, 2006. Post partum examinations were also carried out within the farm premises. Tissue sample were taken for histology using H and E for staining procedures. Likewise, lymph node samples were sent to the national Veterinary Research Institute, VOM, Nigeria for confirmatory diagnosis using polymerase chain reaction as described by Antiabong *et al*, (2006) and Omotainse *et al*, (2007). Carcasses were deeply buried within the farm area.

Case Report

There was a sudden death of two (2) sows on the 16th August, 2006. Death rapidly progressed (Figure 1). Adult pigs were earlier affected than the young ones. The farm recorded 8, 10, 14, 6, 5, and 2 deaths in the 1st, 2nd, 3rd, 4th, 5th and 6th week respectively. These brought the total number of dead pigs to 45 leaving only 2 weaners boar as survivors. The survivors were however recommended for destruction.

Clinical signs included high fever, increased pulse and respiratory rates, anorexia, listlessness, in-coordination and cyanosis of the skin, ocular discharges, vomiting, diarrhea and death within 5 – 6 days after the onset of the fever.

Gross lesions included oedema and cyanosis on the hairless areas of the skin and cutaneous ecchymoses on the legs and abdomen. Excessive fluids were found in the pleural, pericardial and peritoneal cavities, also widespread petechial hemorrhages occurred in the intestinal serosa, spleen, liver, lymph nodes, lungs, heart and stomach and visceral surface of the kidney and the renal cortex. Petechiae also occurred in the mucous membranes of the larynx, urinary bladder and the central nervous system. Oedema was often prominent in the mesenteric structures of the colon.

Histopathology findings included presence of widespread petechial hemorrhages in the organs such as kidneys, lymph nodes, liver, spleen, bone marrow, bladder, heart and mucosa of the intestines and stomach. In the central nervous system, there were perivascular lymphocytic cuffing, neuronal degeneration and leptomeningitis in both the white and gray matters.

Molecular Analysis

Molecular analysis of the lymph nodes samples by Polymerase Chain Reaction (PCR) confirmed the presence of African Swine Fever virus, *Asfivirus*.

Results and Discussion

Table 1 shows the pig population before and after the ASF outbreak in the polytechnic pig farm. ASF caused a mortality rate of 95.75% (45 out of 47 pigs). In this outbreak, none of the adult boars, sows and gilts survived. It was only two (2) piglets of male sex (boar) that were the survivors and were destroyed. The outbreak of ASF led to the deaths of the infected pigs and economic loss in the polytechnic farm. This is in accord with Oyekunle *et al*, (2007) and Hess (1981).

Table 1: Pig population before and after the ASF outbreak in Delta State Polytechnic Piggery Farm, Ozoro.

	No. of Pigs Before Outbreak		No. of Mortalities During Outbreak						
Types of Pigs	No. of Animals	Weeks	Piglet	Gilt	Sow	Boar	Total	Survivors	% Mortality
Piglet	15	1	-	2	5	1	8	39	17.02
Gilt	13	2	5	3	2	-	10	29	21.28
Sow	15	3	8	2	3	1	14	15	29.79
Boar	4	4	-	4	1	1	6	9	12.77
		5	-	1	4	-	5	4	10.64
		6	-	1	-	1	2	2	4.25
TOTAL	47		13	13	15	4	45	2	95.75

Figure 1 presented a picture of an acute to subacute nature of the disease. Apart from the confirmatory PCR report, the clinical signs and lesions presented in this incidence resemble those of FAO (2000); Ole (2006) and Omotainse *et al*, (2007) for ASF.

For the pig farm of the polytechnic to attain its desire to restock, there must be a concerted improved effort by the management to effectively control or eradicate ASF. The emergence of the disease gave rise to the fear of another reoccurrence, consequently there was no restocking. More importantly is that there were no funds to restock despite the relocation of the farm site more than two years later. The farm was established for learning and research and is non-profit oriented as most academic farms in Nigeria. It cannot therefore generate funds except from outside sources. Lack of funds have been one of the severe constraints affecting the implementation of effective management practices. Farmers need alternative source of funds to withstand sudden loss of stock that ASF brings. Insurance is one of the farm management strategies commonly used against risk and uncertainties in agricultural production. However, not many farms in Nigeria have insurance cover (Alamu and Aminu, 2003).

Conclusion and Recommendations

There is no vaccine nor effective treatment against ASF. The emphasis is on the prevention of the introduction of the disease into a pig farm by strict adherence to standard management procedure, and if there is outbreak, to prevent its spread. While the clinical signs and post mortem lesions alone cannot confirm ASF, the PCR result is confirmatory and distinguishes it from other viral and bacterial diseases of pigs like classical swine fever, erysipelas, pasteurellosis and other septic diseases.

ASF leads to sudden loss of stock and economic loss. Farmers need alternative source of assistance to withstand sudden loss of stock and insurance is that alternative. However not many farmers in Nigeria have insurance cover. Government should institute a serious national control strategy as it is being done for diseases like swine flu.

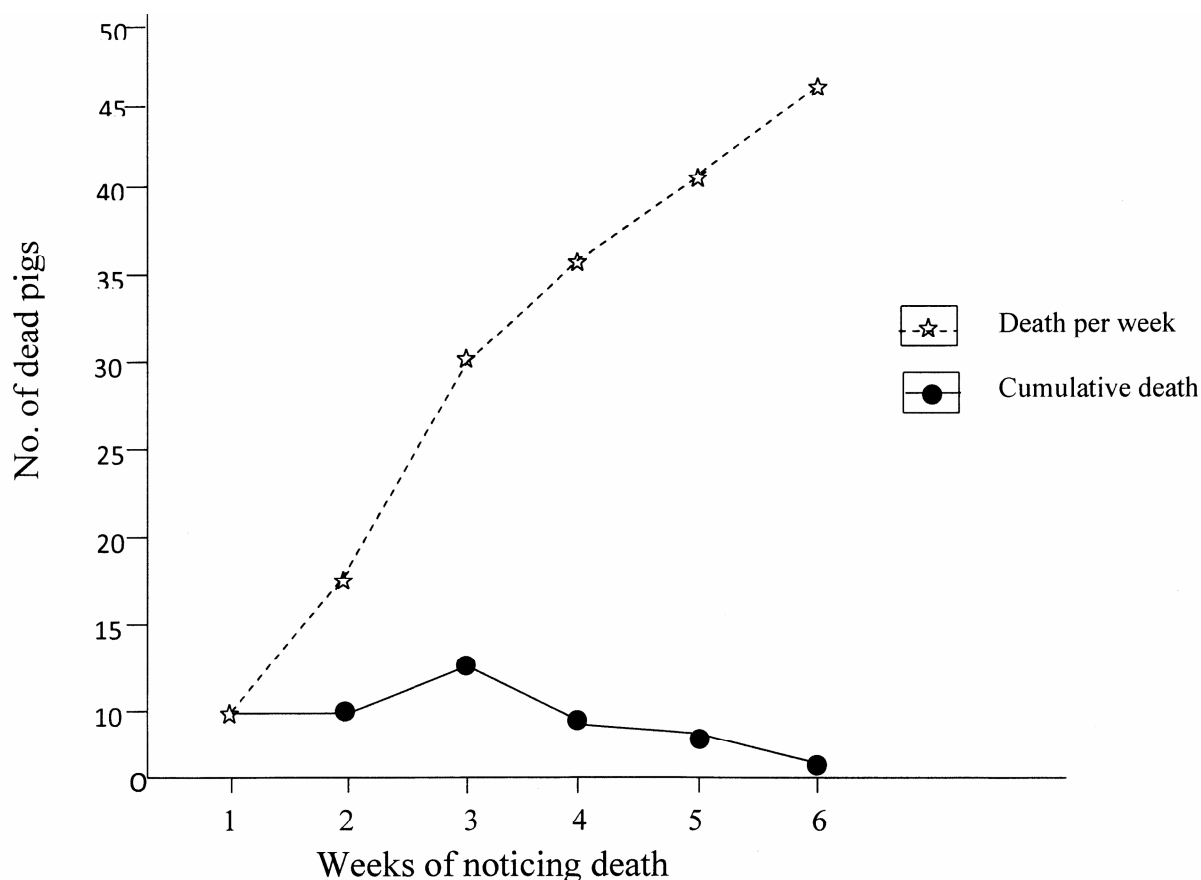


Figure 1: Pattern of death of pigs from ASF

References

- Abdulkadir, I.A. (1989). Infectious disease of livestock in Nigeria: An outline. Ahmadu Bello University Press, Zaria, Nigeria. Pp 222 – 224.
- Aiello, S.E.; Mays, A.; Amstutz, H.E.; Anderson, D.F.; Armour, J.; Jeff-Cott, L.B.; Loew, F.M. and Wolf, A.M. (1998). The Merck Veterinary Manual. 8th ed, Merck and Co. Inc. USA. Pp 504 – 506.
- Alamu, J.F. and Aminu, M. (2003). Socio-Economic Factors Influencing Participation in Crop Insurance by Rice Farmers in Kano State, Nigeria. *Asset Journal Series A3*(3): 7 – 15.
- Antiabong, J.F.; Owolodun, A.O.; Adefalajo, O.A.; Yakubu, B.; Ogedengbe, M.E. and Hamaki, D. (2006). Molecular Evidence of Ttransplacental (vertical) Route of Transmission of African Swine Fever in Foetus of Pig: A Case Report. *The Internet Journal of Veterinary Medicine*. 2:2.
- Ayoade, G.O. and Adeyemi, I.G. (2003). African Swine Fever: An Overview. *Revue. Eler. Med. Vet. Pays. trop* ; 56(3-4): 129 – 134.
- FAO (2000). Food and Agriculture Organisation. Recognizing African Swine Fever: A *Field Manual FAO Animal Health Manual* No. 9. Compiled by P. Mary-Lon and D. Nyakahuma. Information Div FAO, Viale Delle Termedi Caracalla 00100 Rome, Italy.
- Hess, W.R. (1981). African Swine Fever; A Reassessment *Adv. Vet. Sci.* 25:39 – 69.
- Odemuyiwa, S.O.; Adebayo, I.A.; Ammer Laan, W.; Ajuwape, A.T.P.; Alaka, O.O.; Oyedele, O.L.; Soyelu, K.O.; Olaleye, D.O.; Otesile, E.B. and Muller, C.P. (2000). An Outbreak of ASF in Nigeria. *Virus isolation and molecular characterization of the VP72 Gene of a first isolate from West Africa. Virus-Genes* 20:139 – 142.
- Ole (2006). African Swine Fever: aetiology, epidemiology, diagnosis, prevention and control references, OIE World Organisation for Animal Health, ALZO www.oie/int

- Omotainse, S.O.; Oyekunle, M.A.; Sonibare, A.O.; Luther, J.N.; Shamaki, D.; Dipeolu, M.A. and Otesile, E.B. (2007). Clinical and Pathological Features of an Outbreak of African Swine Fever on a Farm in South-West, Nigeria. *Proc. 32nd Ann. Conf. NSAP*, 18 – 21 March, Calabar: 42 – 44.
- Otesile, E.B.; Aguape, A.T.P.; Odemuyiwa, S.O.; Akpavie, S.O.; Olaifa, A.K.; Odaibo, G.N.; Olaleye, O.D. and Adetosoye, A.I. (2005). Field and Experimental Investigations of an Outbreak of African Swine Fever in Nigeria. *Revue Eler. Med. Vet. Pays trop.* 58(1-2): 21 – 26.
- Oyekunle, M.A.; Talabi, A.O.; Olaniyi, M.O.; Abiola, J.O.; Makinde, G.E.O.; Akinleye, S.O.; Adeleke, G.A.; Ettu, R.O. and Ajibola, O.A. (2007). The recent Outbreak of African Swine Fever in Yewa Division of Ogun State. *Proc 32nd Ann.Conf. NSAP*, 18 – 21 March, Calabar: 39 – 41.
- Roseyemamu, M.M. (2000). Recognizing African Swine Fever. A Field Manual FAO Animal Health Manual No. 9 online version: www.FAO.org/DOCREP/004/x8060E