

Case Report

Recent footrot outbreak in Debrezeit swine farm, central Ethiopia

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An outbreak of footrot has occurred in Debrezeit swine farm that is located 44 km south east of the capital. Among 24 pigs, 75% showed lameness, hot, painful and swollen feet, hemorrhagic bruising of the coronary band, heel erosion, sole ulcers and separation of skin from hoof on hind limbs. Bacteriological examination of the specimen from the affected limbs has shown the involvement of *Staphylococcus*, *Streptococcus* and *Dichelobacter nodosus*. The overt clinical lameness and inability to stand or mount can cause reduced reproductive performance. This preliminary finding thus warrants further epidemiological investigation.

Key words: *Dichelobacter nodosus*, Ethiopia, footrot, hoof, lameness

Lameness, particularly foot lameness, can cause significant economic loss in farm animal production. It could be a significant clinical feature in a number of systemic infectious diseases. But the most important causes of foot infections are bacterial pathogens. The prevalence and occurrence of foot infection depends on the presence of certain environmental conditions. In pigs footrot (synonymously known as bush foot) is characterized by erosion of the horn, lamellar abscessation and hemorrhage in affected animals, which could extend to sensitive lamina with discharge at the coronary band [4]. Arthritis and tenosynovitis are the major serious sequelae. This piece of work presents the first report of foot rot outbreak in swine in Ethiopia.

Case history

An outbreak of footrot (bush foot) has occurred in government owned Debrezeit Swine Farm in March and April 2004. It is located at 44 km, south east of the capital, Addis Ababa, with altitude of 1900 m and characterized by hot and moist weather. It is a closed farm with its own breeding and replacement stock. The pig herd were divided

into three groups: the finishing herd, the breeding stock and the young growing herd.

The house was constructed of concrete floor and roofed with corrugated iron. It was a poorly managed farm with limited husbandry and health care practices. Uncontrolled breeding is common and there were unhygienic feeding and watering troughs. The farm holds 400 pigs of which 24 (6%) have clinical lameness.

Clinical findings

Clinical examination of those pigs with clinical lameness revealed overt lameness evidenced by hanging of the affected limbs and lying down, reluctance to move and stand and bruising of the coronary band with active hemorrhagic streaks. On close physical examinations there were swollen and hot feet around the feet lock and pastern areas. Palpation of these swollen tissues was painful. Some of the animals had clearly separated skin from the underlying horny tissues with active wounds. Small amount of serosanguinous exudates has been accumulated in the interdigital space, which has unpleasant odor on incision. Heel erosion and sole ulcers were less commonly observed lesions. The 8 of the 24 pigs (33.3%) examined had all the four limbs affected, 12 of them (50%) had more than one limb affected and 18 of them (75%) had hind legs infected. They were found in difficulty to either mount or stand for service.

Examination of the housing revealed poorly laid concrete floor with rough and pointed surfaces. There were a number of denuded areas on the floor that holds puddles of water, urine, mud and other waste materials. Foot bathing was not a common husbandry practice.

Laboratory findings

Swab samples from the periphery of wounds and aspirated serosanguinous exudates with sterile needle and syringe were collected and delivered to the National Veterinary Institute Diagnostic Laboratory. Two plates with tryptose agar were streaked with the specimen. One of the plates was incubated aerobically while the other was incubated anaerobically using anaerobic jar. Two different bacterial

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colonies appeared on the plate that was incubated aerobically. Most of the colonies were medium sized, round, smooth and with glistening while some of them were small translucent colonies. Gram staining of the former colonies revealed gram-positive coccoid organisms in clumps. They were found to be catalase positive. The smaller colonies revealed the presence of gram-positive coccoid in chain. They were catalase-negative. This indicated the involvement of *Staphylococci* and *Streptococci*.

Anaerobically incubated plate revealed growth bacterial organisms with the colonial appearance of small, smooth, circular, shiny type. Gram stained smear from the culture showed polymorphism with gram negative, short and medium sized rods. Some were elongated rods while others were curved, with swollen ends and vacuoles. The colonies were picked with inoculating loop and transferred to broth containing peptone (10 g), magnesium sulphate (0.2 g), L-cystein (0.5 g), yeast extract (3 g), glucose (10 g), lactalbumin (10 g), sodium chloride (5 g) and distilled water up to 1 liter. The pH was adjusted to 7.6. Similar broth with out L-cystein was simultaneously inoculated with a colony. Both were incubated at 37°C for 48 hrs. There was no growth in the later broth while the bacterium grew in the former broth. Growth of this bacterium in broth was evident by sticking turbidity. It was found to be strictly anaerobic organism. They were non-motile, fermented glucose but not lactose and H₂S negative. Due to the absence of facilities it was not possible to carryout some specific tests. However, the cultural, biological and biochemical properties recorded strongly suggest the isolate to be *Dichelobacter nodosus*. The cultural, biological and bacteriological of properties of *D. nodosus* recorded in these findings were in consistent with that of Parker [3], Kriege and Holt [2] and Quin *et al.* [4].

The isolation of Staphylococcal and Streptococcal organisms pose ambiguity because it is difficult to decide whether they are responsible for the infection or encountered as secondary contaminants. The significance of *Dichelobacter nodosus*, (previously known as *Bacteriodes nodosus*) has specially been stressed by many workers as the cause of swine foot rot.

The prevalence of clinical lameness was 6%, which is not in agreement with Radostits *et al.* [5]. Higher incidence of

clinical lameness in this report was due to the prevailing predisposing factors. The presence of rough, sharp surfaces and wet areas were shown to significantly increase the incidence of footrot in pigs [4] and other animals [5]. The rough and pointed concretes frequently traumatize the hoof and associated tissues. This breaks the primary defense line of the feet and opens the portal of entry for the pathogens. Wetness due to the accumulated water, urine and waste is responsible for maceration of the skin and horny tissues. Both favor the infection and multiplication of the responsible bacterial organisms. Hind limbs were affected more than the fore limbs. This agrees with findings of Radostits *et al.* [5] and Egerton *et al.* [1]. The higher prevalence of lesions on hind legs could be due to the more weight bearing function of hind legs.

Higher incidence of lesions in the hind limbs and higher prevalence of clinical lameness can cause reduced reproductive performance and hence impaired productivity. Reduced consumption of food and water could bring loss of weight. Since this is the first report of swine footrot in Ethiopia, further epidemiological investigation is recommended. Segregation of affected animals and correction of the unfavorable flooring with provision of adequate bedding material was suggested to control the disease.

References

1. **Egerton JR, Yong WK, Riffkin GG.** Foot Rot and Foot Abscess of Ruminants, pp. 235-248, CRC Press, Boca Raton, 1989.
2. **Krieg NR, Holt JG.** Bergey's Manual of Systematic Bacteriology, Vol. 1, pp. 602-628, William & Wilkins, Baltimore, 1984.
3. **Parker T.** Topley and Wilson's Principles of Bacteriology, Virology and Immunity, Vol. 2, 8 th ed. pp. 552-564, Mosby, St. Louis, 1990.
4. **Quinn PJ, Markey BK, Carter ME, Donnelly WJ, Leonard FC.** Veterinary Microbiology and Microbial Disease, pp.476-480, Blackwell, London, 2002.
5. **Radostits OM, Blood DC, Gay CC.** Veterinary Medicine: A Text book of the Diseases of Cattle, Sheep, Pigs, Goats and Horses, 9 th ed., pp. 959-961, Saunders, Philadelphia, 2000.