

## An outbreak of selenium toxicosis in a pig farm: case report

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**Introduction:** Selenium is an essential element for mammals, implicated in many biological functions [1]. This element is particularly important in pigs, as it is involved in reducing oxidative stress and the resulting gastric diseases [2]. As this element is not widely available in the raw materials included in swine feeds, it must be added in the formulation [2]. Selenium supplementation is regulated by the European Union, with a limit of 0.5 mg/kg of 88% dry matter (DM) feed in most production mammals [3]. A concentration greater than 1 to 5 mg/kg feed is considered as toxic in pigs [3].

**Case history:** In a 9-sow Piétrain teaching pig farm, between December, 22, 2023 and January, 11, 2024, 9 growing entire male or female pigs and 2 boars suffered from anorexia and locomotory disorders (Figure 1; 11/11 had lesions of the hoof wall, 4/11 lameness, 3/11 paresis). In 2/11 pigs, alopecia localized to the tail was also reported. All affected pigs were fed the same commercial diet. Two castrated male fattening pigs fed a mix 50:50 of this diet and another during about 4 weeks did not present any disorder. Gilts and sows (n=10) as well as suckling and then weaned piglets (n=21) received different diets and were not affected by the outbreak. The differential diagnosis included infectious diseases such as foot rot, swine vesicular disease, foot-and-mouth disease, Senecavirus A disease and vesicular stomatitis. As all the affected pigs were fed the same feed, ergot and selenium intoxication were added to the differential diagnosis. Notifiable diseases were ruled out by serological testing. The cleanliness of the farm's bedding allowed to discard the hypothesis of foot rot. Feed was tested for ergot, and the results all came back negative. Serum selenium levels in sampled affected pigs were between 7 and 8 mg/L. Feed samples collected from the feeders of affected pigs showed a selenium concentration of 30 mg/kg DM. Fifteen days after removing the contaminated feed from the feeders, serological selenium concentrations were still comprised between 4 and 4.5 mg/L serum. One boar was euthanized because of paresis and the severity of hoof lesions. Some gilts were downgraded to fatteners because of poor legs and quality horn.

**Discussion:** We should remember that food poisoning, just like infectious diseases, may cause severe but also very similar lesions [1,3]. In this outbreak, the serum values were much higher than those reported in the literature [3,4]. Some authors have described cases of acute selenium intoxication associated to sudden deaths, but it was not the case here. Among hypotheses that could explain this: a possible non-homogeneity of the feed, and so a day by day ingestion of fluctuant levels of selenium, or a greater resistance of black and white hair Piétrain pigs to selenium poisoning [5]. The slow reduction in serum selenium concentrations (on average, 60 days) should be highlighted [4], as it raises questions about the risk for human consumers of pork from pigs that are poisoned but don't yet show evident signs of intoxication.

**Conclusion:** The possible dietary origin of health problems should never be ruled out. This case report should familiarize ourselves with nutritional diseases and help us from now on to include them in differential diagnoses. Selenium poisoning may still sporadically occur in well-managed pig farms.

References: [1] Qizhuang et al. (2021) Bull Environ Contam Toxicol, 106 : 715-726; [2] Li et al. (2022) Res Vet Sci 144 :142-148; [3] Nathues et al. (2010) CVJ, 51: 515-518 ; [4] Davidson-York, J Vet Diagn Invest, 11: 352-357. [5] Kim et al. (2001) J Anim Sci, 79(4): 949-55



**Figure 1.** Picture of foot lesion observed in an affected pig. An ischaemic line is present at the base of the hoof crown (arrow).