Nitrate Poisoning in Swine

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Nitrate Poisoning in Swine. On July 23, 1959, a call was received from a client who reported that his hogs were sick. Upon arrival at the client’s farm, two dead pigs were found. Three other pigs were weak and when forced to move, did so at a staggering gait. These pigs were examined. The temperatures ranged from 101.5° to 102.7° well within the normal range. One pig was noted to be breathing rather rapidly and evidence of a watery diarrhea was noted on all of the affected pigs. One of the pigs was unable to rise. A slight dilation of the pupils was noted.

Upon post-mortem examination of two pigs, a large quantity of colorless fluid was noted in the peritoneal cavity of one. Much peri-renal edema was noted in both as well as subcapsular ecchymotic hemorrhages of the kidneys. The blood was a dark color and slightly watery. No gross lesions were noted in the gastric or the intestinal mucosa. The contents of the stomach were ground grains and greens. The liver was slightly hyperemic.

Upon questioning the owner, it was determined there had been no recent change in feed except from a starter to a grower protein mixture. The shotes were running in a small lot with no pasture. Upon examination of the lot, it was noted that several stumps of weeds were all that was left of a large weed patch. The plants, of which a few were left, were the redroot pigweed (Amoranthus retroflexus) and lambsquarter (Chenopodium album). After looking at the stumps, the owner mentioned that the pigs had suddenly taken to eating the weeds and had consumed them over a two day period.

A diagnosis of a possible nitrate poisoning was made. It was confirmed later by a laboratory report. The laboratory proceedings by a commercial laboratory consisted of a post-mortem examination and bacterial culturing. No blood chemistry work was carried out.

The remaining pigs were given magnesium sulfate in soaked oats as a purge to empty the digestive tract and the few remaining weeds were removed from the lot.

Under certain conditions, particular plants have the ability to accumulate large quantities of nitrates which if eaten are toxic to animals. Why the pigs suddenly started eating the weeds in the lot in a period of a day and a half is still undetermined. It is thought that in switching the pigs from a starter to the grower ration, the feeder might have been empty for a short period of time.

A week later another client brought two pigs to the clinic for post-mortem examination. The history of having turned the pigs into a feedlot overgrown with pigweeds two days earlier was obtained. The pigs had eaten the weeds to the ground. On post-mortem examination, lesions of peri-renal edema and subcapsular ecchymotic hemorrhages of the kidney were noted. The blood was dark in color. No gross lesions were observed in the gastric or intestinal areas. A diagnosis of nitrate poisoning was made.

There seems to be some discrepancy at present among veterinarians whether cases similar to these are actually poisonings or a peculiar manifestation of enterotoxemia or edema disease. Similar conditions to these have been described as deadly nightshade poisoning and others as whey toxicity. With the accurate histories of these cases in which the pigs were eating large quantities of nitrate rich plants growing on soil rich in nitrogen, it seems plausible that nitrate poisoning does occur in swine.

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