AFLATOXICOSIS IN EMU (*Dromaius novaehollandiae*) CHICKS

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ABSTRACT

The study was conducted in the emu chicks reared at Emu Research Unit, Regional Research Centre, Tamil Nadu Veterinary and Animal Sciences University, Pudukkottai during the year 2011. Emu chicks were kept in the brooder with a floor space of 4 sq.ft/chick. Emu chicks were offered emu starter mash from 5th day onwards and water ad libitum. Chicks were showing gradual loss of appetite, lethargy, loss of weight, depression and ruffled feathers from 13th day onwards. Two emu chicks died on subsequent days at the age of 17 and 21 days. Haemorrhage in the subcutis of the thigh region, enlarged liver with mottled and friable in consistency, distended pericardial sac with amber coloured fluid and congested intestinal and tracheal mucous membrane were recorded in the necropsy. Histologically, diffuse severe vacuolar changes of hepatocytes, congestion of epicardium with multifocal mild sub-acute epicarditis and diffuse mild congestion of trachea were observed. The feed sample was analysed for aflatoxin and it contained aflatoxin B_1-45ppb and aflatoxin B_2-20ppb. From this study, it can be concluded that aflatoxins in the feed caused death in the emu chicks after 13 and 17 days of feeding.

Key words: Emu, Aflatoxicosis, Emu feed, Aflatoxin

INTRODUCTION:

In India, the emu industry has been rapidly growing in recent years because these Australian natives are hardy and can be harvested for their meat, oil and hides. Mortality and health problem in emu are mainly in chicks and juveniles. Aflatoxicosis is the most devastating and wide spread non-infectious disease affecting all species of livestock and poultry. Aflatoxicosis is caused by consumption of feed contaminated with toxic metabolites of fungi i.e., *Aspergillus flavus* and *A.parasiticus*. The present case report describes a rare record of spontaneous aflatoxicosis in farmed emu chicks.

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MATERIALS AND METHODS

Emu chicks were reared under the standard managemental practices at Emu Research Unit, Regional Research Centre, Tamil Nadu Veterinary and Animal Sciences University, Pudukkottai, Tamil Nadu during the year 2010. The emu chicks were raised in the same farm from the eggs incubated artificially. Totally 15 chicks were kept in the brooder with a floor space of 4 sq.ft/chick. Feed was not offered to emu chicks for first 4 days in order to yolk get absorbed completely. Emu chicks were offered emu starter mash from 5th day onwards and water *ad libitum*. The feed ingredients like sorghum, soya been meal, rice bran, sun flower oil cake were utilized to prepare the starter mash. The clinical signs of live affected chicks were recorded. Necropsy was conducted on dead chicks and the gross lesions were recorded. Representative tissue pieces from dead chicks were collected in 10% formalin and processed routinely and sections were cut at 5ì thickness and microscopic lesions were recorded. Feed sample was analyzed for aflatoxins (Modified AOAC Romer Minicolumn Method, 1990) and the results were recorded.

RESULTS AND DISCUSSION

Out of 15 emu chicks, 5 chicks started showing gradual loss of appetite, lethargy, loss of weight, depression and ruffled feathers from 13th day onwards. Two emu chicks died on subsequent days at the age of 17 and 21 days. On necropsy, subcutis of the thigh region revealed haemorrhage. Liver was enlarged, mottled and friable in consistency. The pericardial sac was distended with amber coloured fluid. The myocardium was congested. The intestinal and tracheal mucous membrane were congested. Histologically, the liver showed diffuse severe vacuolar changes of hepatocytes (Fig.1) and sinusoidal congestion. Heart revealed congestion of epicardium with multifocal mild sub-acute epicarditis. Trachea showed diffuse mild congestion. The feed sample was analysed and it was found to contain aflatoxin B_1 - 45 ppb and aflatoxin B_2 - 20 ppb. After withdrawal of feed, there were no further mortality and the remaining chicks recovered completely.

Aflatoxicosis is the important disease in poultry and other food-producing animals and has been attributed to the ingestion of various feeds contaminated with aflatoxin produced by *Aspergillus flavus* and *A. parasiticus*. These toxigenic fungi are known to produce a group of extremely toxic metabolites, of which aflatoxin B1 (AFB1) is the most potent. Avian species especially chicks, goslings, ducklings and turkey poults are the most susceptible to aflatoxin toxicity (Dalvi, 1986). The origin of the infection was not established in this case study, but it was likely from contaminated feed.

Consumption of aflatoxin contaminated feed resulted in loss 95 appetence, lethargy, poor performance, decreased body and organ weights, ruffled feathers and mortality and the signs were in agreement with Rawal *et al*.(2010).

The starter mash used in this case study contained soya been cake, sorghum, sun flower oil cake. Rawal *et al*., (2010) stated that the feed ingredients like groundnut cake, soya been cake, cotton seed and sorghum were responsible for introducing aflatoxin in poultry feed. Conditions that favoured contamination by mycotoxins includes excessive moisture both in field and post harvest storage, high humidity, temperature extremes, drought stress and insect damage to crops (Coulombe, 1993). The optimum temperature (24-27^{0}C), humidity (85 to 95%) and moisture (>15%) for the growth and production of aflatoxin in the grains was prevailing during winter months in Tamil Nadu. In the present case, deaths in emu chicks were noticed in the month of January which coincided with the winter months in Tamil Nadu.

Histopathological examination revealed liver damage in this study. Basically, pathological findings observed in all poultry species for aflatoxin were same (Chute and Richard, 1997). The toxic effects of aflatoxin were mainly localized in liver and caused hepatic necrosis, bile duct proliferation, icterus and hemorrhage (Dalvi, 1986). The clinical signs, postmortem findings and histopathological findings in this study were similar to those previously described for other avian aflatoxicosis (Quist *et al*., 2000).

Literatures regarding the minimum toxic level of aflatoxin in the feed for emu birds were not available. The toxicity of aflatoxin B1and B2 in poultry varies from species to species. There are numerous reports that feed-borne aflatoxin B1 and B2 contamination which significantly affects productivity in poultry. Rustom (1997) suggested the accepted level of 20 ppb aflatoxin in the poultry feed. Pandey and Chauhan (2007) recorded that the dietary aflatoxin at 2.5 mg/kg significantly reduced the feed intake by 9-11% of poultry among all age groups (7 to 280 days old). Dietary exposure of broiler hens to aflatoxin (10 mg/kg) resulted in embryonic mortality and lowered the immunity in the progeny chicks (Qureshi *et al*., 1998).

Definitive diagnosis was made based on histopathological examination and aflatoxin level in the feed which was fed to the emu chicks. It was possible that other chicks in the brooder had subclinical infection. From this study, it is concluded that aflatoxin B_1 - 45 ppb and

aflatoxin B_2 - 20 ppb caused death in the emu chicks after 13 and 17 days of feeding.

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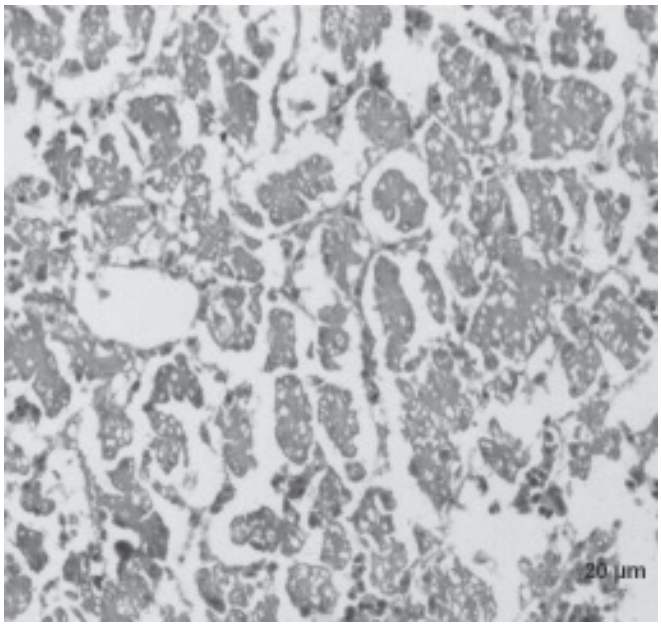

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Fig.1.
Hepatocytes showing vacuolar changes and sinusoidal congestion.
Hematoxylin and eosin stain. Bar=20 µm.