



## CURLED TOE PARALYSIS IN KUROILER CHICKEN-A CASE REPORT

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### INTRODUCTION

Chickens like other animals depend on various feed resources for the fulfilment of their vitamin requirement. Chickens are much more susceptible to deficiency diseases specially vitamin deficiencies than other animals. Chicken being the monogastric animal, the gut flora of chicken does not synthesis any vitamins rather compete with host for dietary vitamins. More over higher metabolic rate of chicken also needs higher amounts of vitamins to perform vital metabolic reactions in the body. The requirement of vitamin B2 for grower chick is about 2mg/kg of diet (Singh et al., 1995). Riboflavin is a critical vitamin in the diet of breeder hens for production of hatching eggs. Curled toe paralysis in chicken is associated with riboflavin (vitamin B2) deficiencies. Riboflavin deficiency in chicken severely affects the tissues of the epithelium and myelin sheaths of the main nerve trunk especially in the sciatic nerve. In growing chickens' degenerative changes in the sciatic nerve produce characteristic diseases/symptoms commonly known as 'curled toe' paralysis. It is one of the most characteristic signs associated with the vitamin deficiency, resulting in the curling of the chicks toes. The condition nervous system related due to peripheral nerve damage, related to degeneration of the sciatic nerves (the nerves along the back of the chick's leg to the foot). The damage can be reversed if treated quickly, however in longstanding cases where treatment is delayed the condition will become permanent. Although curled-toe paralysis is seen commonly in newly hatched chicks, studies have shown that only about 10% of riboflavin-deficient chicks develop clinical signs.

### About Kuroiler bird

The Kuroiler is a hybrid type of chicken developed by the Keggfarms Group in Gurgaon, Haryana. This hybrid chicken are derived from crossing either coloured broiler males with Rhode Island Red (RIR) females, or, White Leghorn males crossed with female Rhode Island Reds (RIR). It is a dual-purpose breed producing meat as well as eggs, can thrive on low input system i.e a diet of kitchen and agricultural waste, insects, worms, tender leaves of grasses, fallen seeds etc and produce around 150 eggs per year in compare to indigenous hens which lay only 40-50 eggs per year. The meat yield per bird of Kuroilers is also greater; males weigh approximately 3.5 kg and females about 2.5 kg. Due to its unique genetic features, the Kuroiler is resistant to common poultry diseases. Introduced in the early 1990s, the breed was created by Vinod Kapur of Kegg Farms Private, Ltd., and the name is a portmanteau of Kegg and Broiler (KUROILER). It is a suitable breed for backyard poultry farming in rural India. Kuroiler bird rearing can play a pivotal role in alleviation of malnutrition in rural areas and a good source of supplementary income for rural farmer.

### Rearing of birds

2000 Kuroiler birds were procured from Keggfarms Private Limited, Gurugram Haryana. The birds were reared in the poultry farm of Division of Livestock Production and Management under deep litter system and sawdust was used as bedding material. The birds were provided commercial diet ad lib. and adequate clean drinking water. The chicks were vaccinated against Ranikhet disease at 5 days and Infectious bursal disease at 14 days. After one week 150 birds were shifted to battery cages and rest were reared under deep litter systems.

### CASE HISTORY

As reported by the attendant few growing Kuroiler chicken have shown the symptoms of toe deformities and unable to walk properly at around 7 weeks of age (Fig 1). Then the birds were taken out from the cages and observed closely for identification of problems and confirmed as curled toe paralysis. The birds were unable to stand properly, partial loss of appetite, reluctant to move toward feed and water, sitting in a corner, ruffled feather etc. was observed.

### Clinical signs observed

The toes of both the feet are curled inward direction. The birds were not inclined to move freely and often walk on hock joints taking support of wings. The muscles of the leg become atrophied which may be due to impairment of the function of sciatic nerve. Eyes, nose and skin of the affected birds become dry and shrunken. Stunted growth, weight loss, emaciation etc. were observed clinically.

### Treatment

Groviplex 500 ml, manufactured by Virbac Animal Health contains (nutrient value per 5 ml) Vitamin B12 (1.25 mg), Vitamin B3 (18.75mg), Vitamin B5 (0.65 mg), Vitamin B6 (0.62 mcg), Vitamin B12 (6.25 mcg), Calcium gluconate (50 mg), Amino acids (100 mg) were provided @ 20 ml per 100 birds through of drinking water for a period of 15 days along with Agrimin powder@ 30g/kg of feed for a period of 15 days.



**Fig 1: Showing Curled toe paralysis.**

### RESULTS AND DISCUSSIONS

After 5 days of the treatment slight improvement was noticed and progressing gradually. The complete recovery was observed after 2 weeks of continuous treatment. The epithelium and myelin sheaths of some of the main nerves like sciatic nerves are affected in Riboflavin (Vitamin B2) deficiency which causes “curled-toe” paralysis in growing birds. Segmental demyelination with endoneurial edema, hypertrophic Schwann cells, lipid deposition in the cytoplasm of Schwann cells and focal myelin swellings leads to splitting, degeneration and enlargement of the nerve, atrophy as well as flabbiness of the leg muscles and in advanced stages the chicks lie horizontally with extended legs, sometimes in opposite directions (Cai *et al.*, 2006, Deodato *et al.*, 2002). It has been reported that the birds recover spontaneously after 3 weeks possibly due to the formation of endogenous riboflavin by intestinal bacteria

and also riboflavin requirement was decreased with increasing age and decreased growth in chickens (Cai *et al.*, 2006). Riboflavin deficiency also results in a decrease in the conversion of the vitamin B6 (Shane, 2008) and effect iron metabolism (Sandstroem, 2001). Vitamin C acts as antioxidants which prevent oxidative stress and helps in collagen production as well as tissue repair (Bhatt *et al.*, 2018, Patel *et al.*, 2018) Calcium Pantothenate is involved in the utilization of carbohydrates, lipids, proteins synthesis and the preservation of blood vessels integrity.

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