

RESEARCH ARTICLE

FATTY LIVER HAEMORRHAGIC SYNDROME (FLHS) IN LAYING BIRDS: A Case Report

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ABSTRACT

Fatty liver haemorrhagic syndrome (FLHS) is a metabolic condition commonly observed in laying hens and is characterized by sudden death due to liver rupture leading to internal bleeding. The clinical signs observed in this case were reduction in egg production and sudden death. Post Mortem investigation of birds revealed massive pectoral muscle mass, fat deposit on the peritoneum, liver and gizzard, friable and ruptured liver and internal haemorrhage. The flock was managed by reducing the quantity of feed given per day, administration of vitamin mineral supplements and by increasing the ventilation of the pen. The farmer was advised against *ad libitum* feeding and to continue with the vitamin mineral supplements.

Keywords: Fatty liver haemorrhagic syndrome, FLHS, Layers

INTRODUCTION

Fatty Liver Haemorrhagic Syndrome (FLHS) is a metabolic condition of birds mostly observed in female laying hens (Trott *et al.*, 2013). The syndrome is characterized by excess accumulation of fat in the liver which is accompanied by liver haemorrhage (Shini and Bryden, 2009; Dinev, 2019).

Sudden death of the laying hen has been reported to occur due to liver rupture resulting in internal bleeding (Butler, 1976; Shini *et al.*, 2012). Reduction in egg production has been reported by some researchers (Walzem *et al.*, 1993; Shini *et al.*, 2009; Lee *et al.*, 2010; Jiang *et al.*, 2013; Trott *et al.*, 2014).

Fatty liver haemorrhagic syndrome in laying hens is strongly associated with nutrition, as 97% of the affected birds are found to have large fat deposit or are obese (Trott *et al.*, 2014). Environmental factors such as high environmental temperature has been reported to cause this condition (Pearson *et al.*, 1981).

RESULTS AND DISCUSSION

On examination, it was observed that the dead birds were overweight; some birds were weighing more than 2kg as layers. The Combs and wattles of the affected birds were pale and the broad pectoral muscle was massive, and the keel bone was not easily palpated.

At necropsy, it was observed there was broad pectoral muscle mass, there was fat deposition on the peritoneum, the liver was enlarged, congested, ruptured and friable and there was obvious haemorrhagic fluid present in the abdominal cavity due to liver rupture.

The tentative diagnosis was a suspected case of Fatty Liver Haemorrhagic Syndrome. The disease must be differentiated from the followings which are identical serologically and resemble each other closely when examined: Lymphoid leukosis, Cholangiohepatitis, Salmonellosis, Marek's disease and Inclusion body hepatitis.

One of the predisposing factors to Fatty liver haemorrhagic syndrome is high environmental temperature. The ambient temperature was on the high side at the period of investigation of this case the client equally confirming that the weather had been quite hot for the past 3 weeks prior to the death of the birds and the reduction in egg production.

In Marek's and lymphoid leukosis, besides enlargement of the liver there are tumour growths on the liver and other visceral organs (Payne and Venugopal, 2000). No tumour growths were observed in the birds posted.

Calnek *et al.*, (1991) and Ahmed *et al.*, (2008) reported that there is bronze-coloured streak on the enlarged liver and evidence of yellowish diarrhea in cases of salmonellosis. In this case no bronze-coloured streak on the liver observed and there was no diarrhea reported.

In cholangiohepatitis there will be bile duct involvement and jaundice (Onderka *et al.*,

1990). These were not observed in this case.

Inclusion body hepatitis is an adenovirus infection which is characterized by haemorrhages and dystrophic necrobiotic changes in the liver and kidneys and usually accompanied by intranuclear inclusion bodies. In this disease the liver has a characteristic colour and crumbly texture (Dinev, 2019). Villegas (2019), reported that in inclusion body hepatitis yellow mucoid droppings may be seen which were absent in this case.

CONCLUSION AND RECOMMENDATIONS

Lesions observed in the birds posted were more of that of Fatty liver haemorrhagic syndrome. The two measures used to manage the conditions were; reduction in daily feed intake from 6 bags of 25kg feed per day to 5 bags per day. Leeson (2019) explained that FLHS is best prevented by not allowing an excessive positive energy balance in older birds. He also explained that body weight can be monitored and when potential problems are seen, remedial action should be taken to limit energy intake through the use of lower energy diets and or change in feed management. Also recommended by the same author is the inclusion of 0.3 ppm selenium (as organic selenium), about 100 IU vitamin E/kg diet and appropriate levels of an antioxidant such as ethoxyquin. Secondly by the use of ceiling fans to improve the cross ventilation across the pens thereby cooling the birds.

Other measure employed was the use of Vitamin-mineral supplement to boost the immunity of the birds against heat stress as recommended by Sanda *et al.*, 2015.

Leeson (2019) reported that FLHS is easy to recognize at necropsy because of the liver haemorrhage and the fact that the liver is engorged with fat making it friable and difficult to remove each lobe in one piece.

In conclusion, high energy feed is not adequate for layers and heat stress should be prevented in since it can predispose laying birds to fatty liver haemorrhagic syndrome. Cross-ventilation of the poultry house is essential and Layers should not be fed *ad libitum* but should have free access to water.

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Fig 1. Arrow Showing the broad pectoral muscle mass.

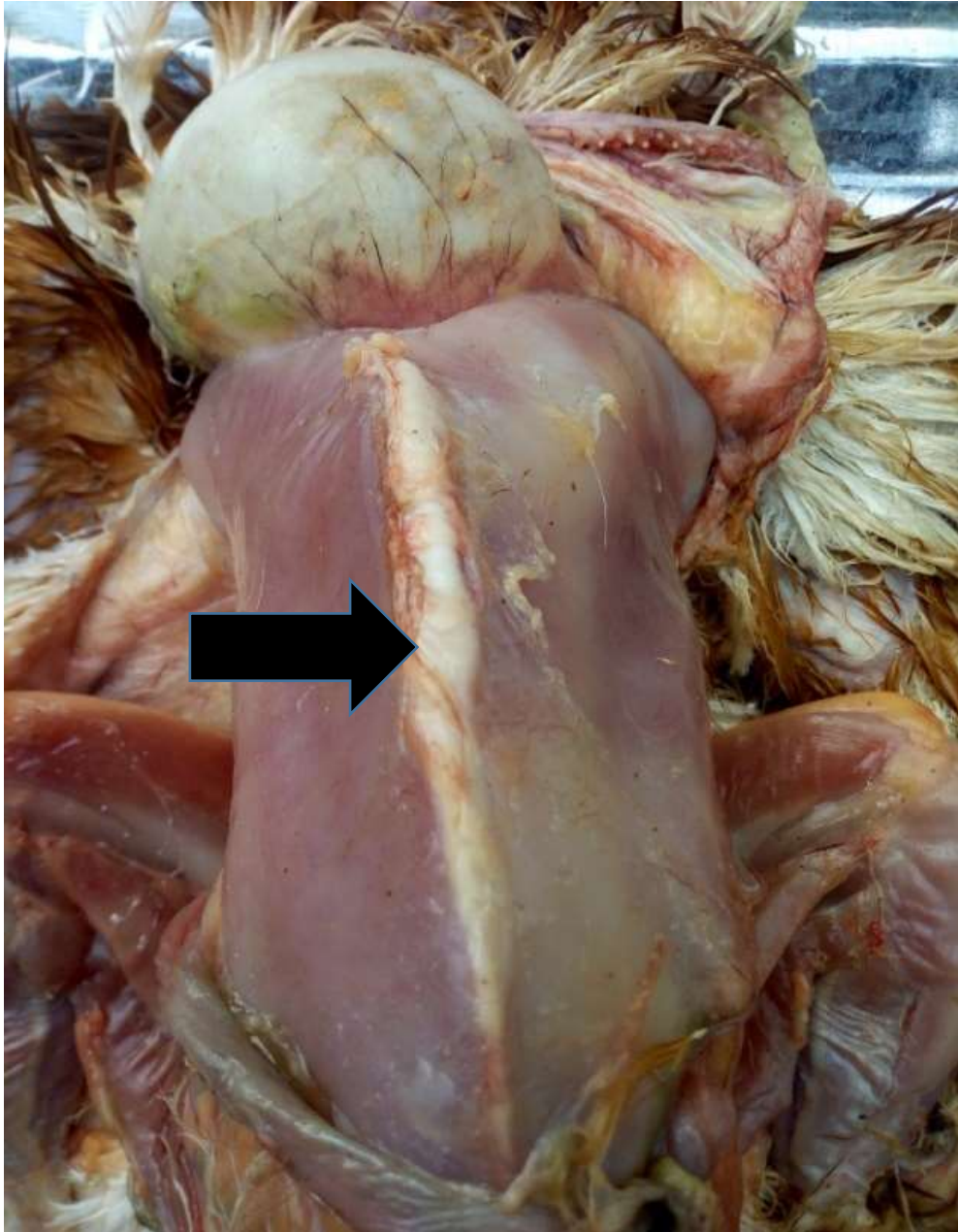


Fig 2. Fat deposit on the peritoneum

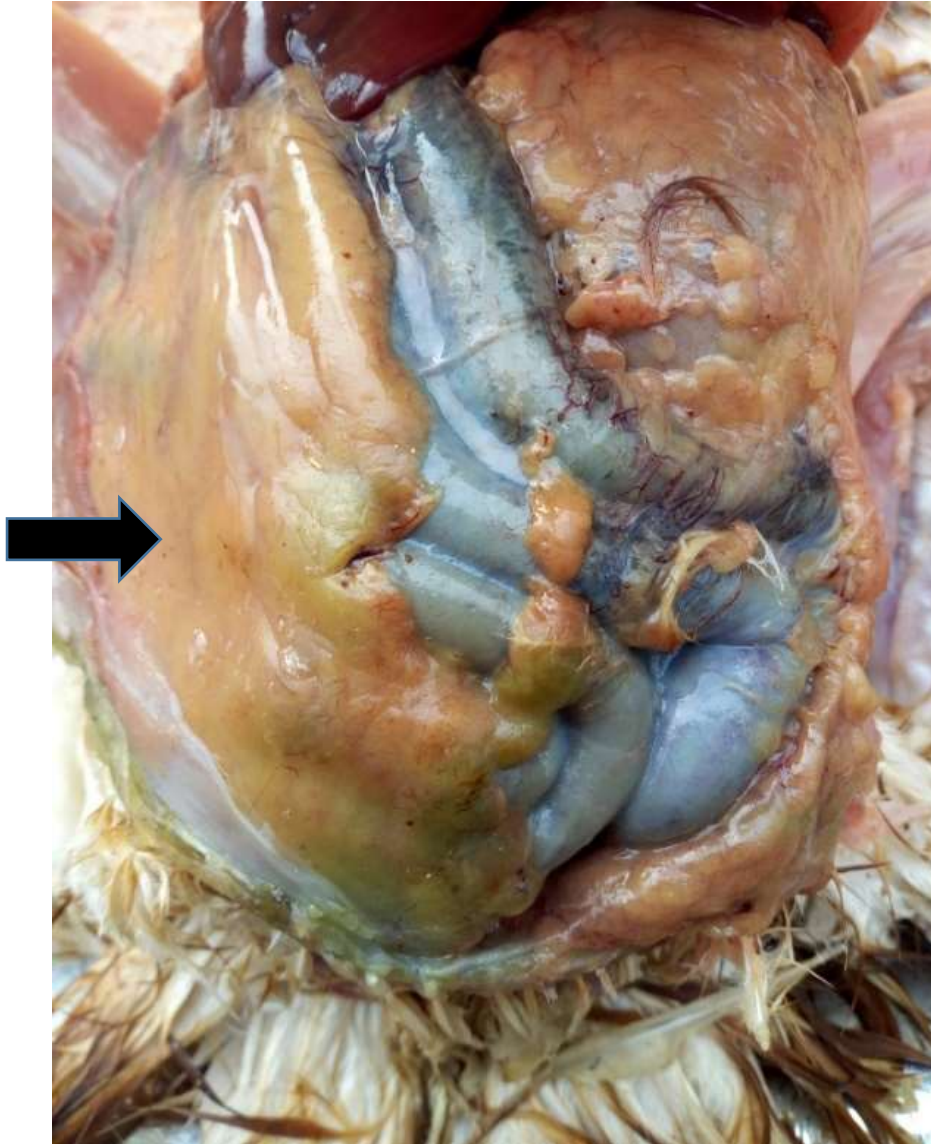


Fig 3: Vertical arrow showing point of liver rupture and Horizontal arrow showing haemorrhagic fluid in the abdominal cavity.

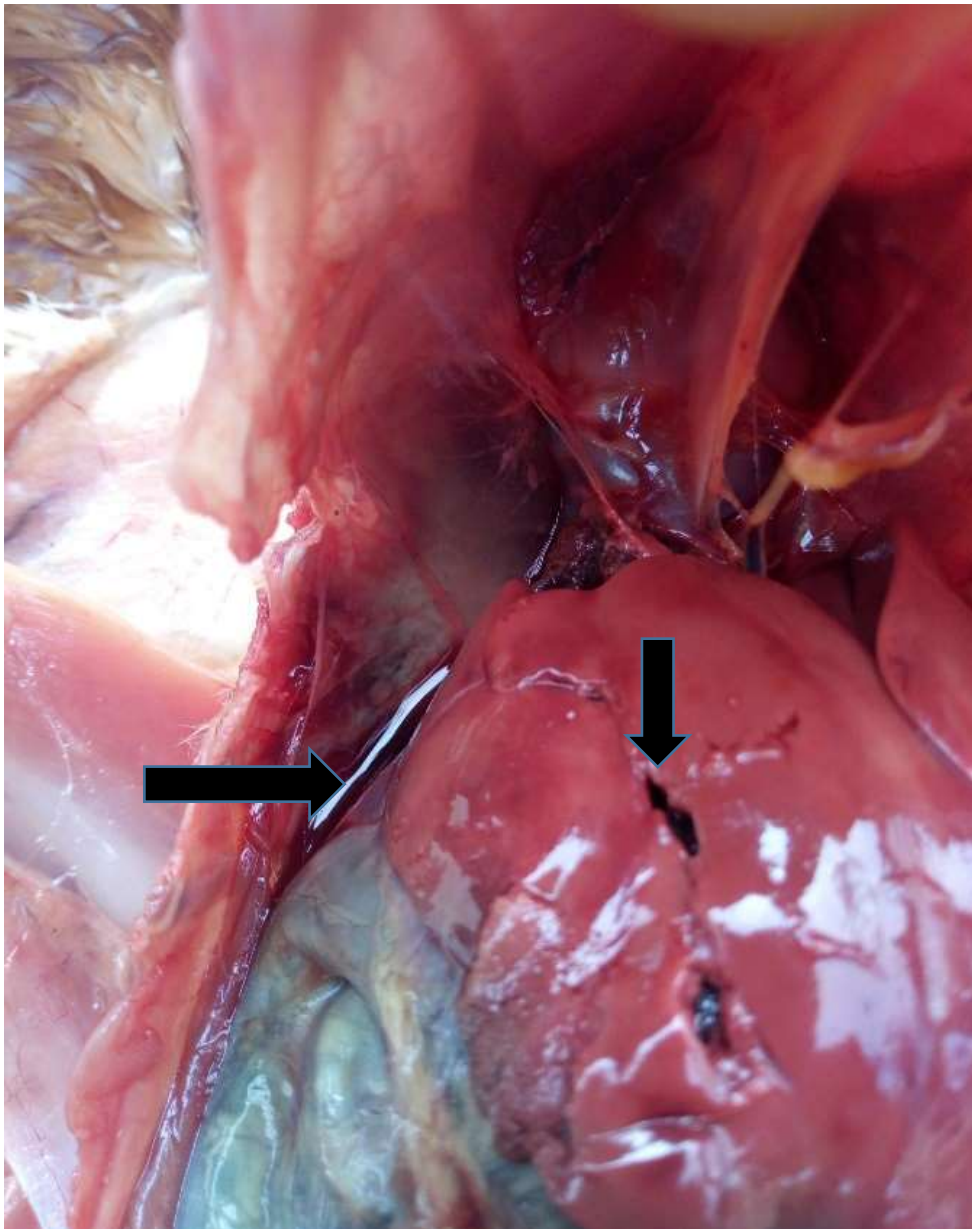


Fig 4: Liver friable and arrow pointing at the liver rupture

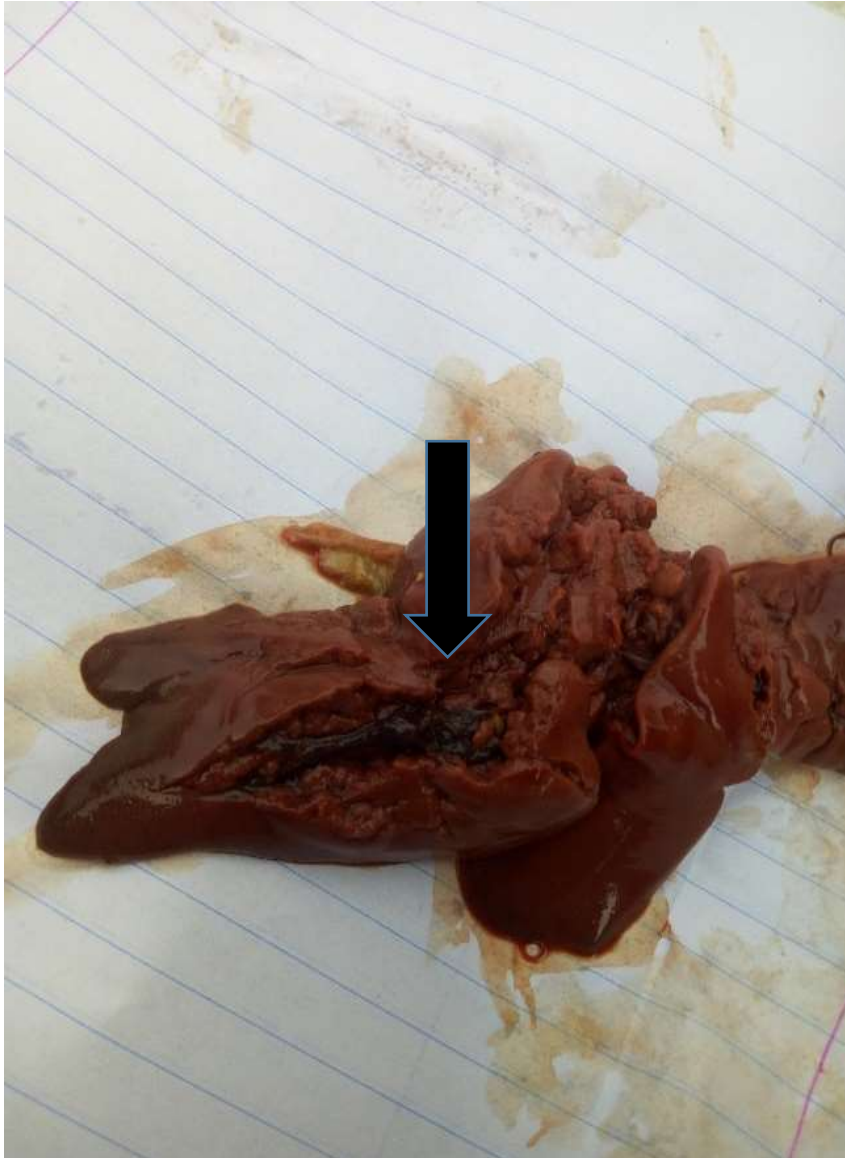


Fig 5: Arrow showing fat deposition on the gizzard.

