Aflatoxins (AF) In Poultry:

AF are a family of toxins produced by certain fungi that are found on agricultural crops such as corn (maize), peanuts, cottonseed, and tree nuts. The main fungi that produce AF are *Aspergillus flavus* and *Aspergillus parasiticus*, which are abundant in warm and humid regions of the world. When these toxins orally ingested with water and feed, they are absorbed in the digestive tract and are bound to serum albumin. Circulating AF are largely metabolized in the liver. Part of the AF bind to macromolecules, such as endoplasmic steroids and enzymes in the hepatocytes, whereas the remaining part is converted into fat and water-soluble metabolites.

AF itself is actually harmless, but its metabolization in the liver through cytochrome P-450, produces epoxide derivatives. After this stage, AF acquires toxic properties and plays a role in the inhibition of DNA, RNA, and protein synthesis in liver. In addition, its binding to several macromolecules causes cytotoxic, carcinogenic, teratogenic, mutagenic, and immunosuppressive effects have been reported effects.

Aflatoxin B_1 is most commonly encountered and considered the most toxic of four naturally occurring AF (i.e., B_1, B_2, G_1 and G_2). Duck and turkeys are the most sensitive poultry species to aflatoxicosis, quails are moderately susceptible, whereas chickens are considered the most resistant. It has been reported that pheasants, geese, and chickens are more resistant than ducks and turkeys. Among quails, Bobwhite are more susceptible than Japanese quails. One explanation for the high sensitivity of ducks to AFB_1 could be that the enzymes (cytochrome P450 family) responsible for bioactivation of AFB_1 show a higher activity than in chickens, turkeys or quails. In addition, the lower tolerance of ducks also could be explained by a lower activity of hepatic enzymes responsible for cellular detoxification and excretion of a variety of toxic substances. The discovery and isolation of AF can be traced back to the mysterious Turkey X disease of 1960, which resulted in the loss of several thousands of turkey poults in the United Kingdom.

In general. Adverse effects of AF also include reduction in growth rate, feed efficiency, decreased egg production, hatchability, and increases susceptibility to disease. Furthermore, residuals of AF from animals can appear in edible animal products for human consumption, which raises public health concerns.

Lesions- The most obvious microscopic findings related to acute and chronic aflatoxicosis are observed in the liver. Lesions can also be observed in other organs,

such as the kidneys, spleen and bursa of Fabricius. The bursa of Fabricius may present lymphoid-cell depletion and intrafollicular cysts.

At gross examination, the liver is pale and enlarged. The main histopathological findings are oil vacuoles in the hepatocytes, hydropic degeneration, necrosis, and bile duct proliferation. The kidney and spleen may be enlarged, and their surfaces may present petechial hemorrhages. Tubular degeneration and capillary hyperemia are commonly observed in the kidneys, and lymphoid-cell depletion and necrosis in the spleen.

In brief, AF contamination is still a threat to the poultry industry and results in substantial economic loss to producers because of often sub-lethal, but toxic effects.