

Residues of aflatoxins in the meat of chicken and duck in Iran

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Abstract— Aflatoxins are a group of mycotoxins produce by *Aspergillus* species. Aflatoxins are toxic and carcinogenic metabolite for animals and human. So the presence of aflatoxins in foods is a potential threat to the health of consumer. There are little observations of aflatoxins residues in retail meat especially in chicken and duck meat. Poultry products are one of the few foods that are used extensively throughout Iran as a major source of protein. So in this survey we investigated the total aflatoxins residues in the meat of duck and broiler chicken in central and northern part of Iran.

40 samples include 20 samples of chicken meat and 20 samples of duck meat from different regions of Tehran and Mazandaran province were collected randomly and transfer to the laboratory. Aflatoxins residues were measured by MaxSignal Total Aflatoxin ELISA Test Kit. The method is based on competitive colorimetric ELISA assay.

According to the results, mean of total aflatoxins residues in chicken meat was $6.39 \pm 1.9SD$ and in duck meat was $2.58 \pm 0.89SD$ ppb. Maximum residues in all samples were 9 and the minimum was 1.17 ppb. Results showed no significant difference between different places of sampling ($p < 0.05$). Maximum residues were in wings and the minimum was in breast meat. Although all samples showed contamination lower than permitted level (20 ppb), present of contamination in all samples is warning for public health and it seems more research is required.

Keywords— Aflatoxin, Chicken, Duck

I. INTRODUCTION

Mycotoxins are secondary methabolits produce by fungi. It is estimated that there are about 300 mycotoxins harmful to human or animals. One of the well known groups of mycotoxins is aflatoxins. Aflatoxins are a group of mycotoxins produce by *Aspergillus* species. Aflatoxins are toxic and carcinogenic metabolite for animals and human. Exposure to aflatoxin is known to cause both chronic and acute hepatocellular injury [1].

So the presence of aflatoxins in foods is a potential threat to the health of consumer. In developing nations, many people are exposed to aflatoxin through food and food do not routinely test for the presence of aflatoxin. As a result, an estimated 4.5 billion people living in developing countries may be chronically exposed to aflatoxin through their diet. In Iran some research has been done to evaluate aflatoxin residue in food especially in milk and dairy products but there are little observations of aflatoxins residues in retail meat especially in chicken and duck meat [2].

Poultry products are one of the few foods that are used extensively throughout Iran as a major source of protein. So in this survey we investigated the total aflatoxins residues in the meat of duck and broiler chicken in central and northern part of Iran.

II. MATERIAL AND METHODS:

40 samples include 20 samples of chicken meat and 20 samples of duck meat from different regions of Tehran province in central part and Mazandaran province in northern part of Iran were collected randomly and transfer to the laboratory. Aflatoxins residues were measured by MaxSignal Total Aflatoxin ELISA Test Kit. The method is based on competitive

colorimetric ELISA assay. The toxin of interest has been coated in the plate wells. During the analysis, sample is added along with the primary antibody specific for the target toxin. If the target is present in the sample, it will compete for the antibody, thereby preventing the antibody from binding to the toxin attached to the well. The secondary antibody, tagged with a peroxidase enzyme, targets the primary antibody that is complexed to the toxin coated on the plate wells. The resulting color intensity, after addition of substrate, has an inverse relationship with the target concentration in the sample.

Results were analyzed statistically, using the statistics program SPSS 16.

III. RESULT AND DISCUSSION

According to the results, mean of total aflatoxins residues in chicken meat was $6.39 \pm 1.9SD$ and in duck meat was $2.58 \pm 0.89SD$ ppb. Maximum residues in all samples were 9 and the minimum was 1.17 ppb.

It has been clearly seen in fig 1, there was a significant difference between contamination in chicken and duck meat.

Results showed no significant difference between different places of sampling and aflatoxins residue ($p < 0.05$). Maximum residues were in wings and the minimum was in breast meat.

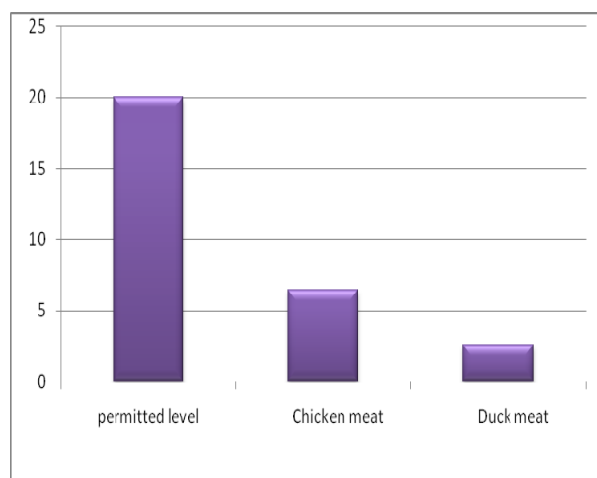


Fig. 1 Aflatoxins residue in Chicken and Duck meat

All samples showed contamination lower than permitted level (20 ppb), but significant point is that contamination is shown in all samples.

IV. CONCLUSIONS

Aflatoxins residues in poultry tissues may build up to high levels in areas with no regulatory limits on aflatoxins levels of poultry feed and may pose a risk to consumers health [3].

Results indicate that the excretion of aflatoxin residues in meat samples might occur at relatively low concentrations under conditions of long-term exposure of poultry to low levels of aflatoxins [4].

Although in this study all samples showed contamination lower than permitted level (20 ppb), presence of contamination in all samples is warning for public health and it seems more research is required.

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