CONTAMINATION OF MEAT AND MEAT PRODUCTS WITH FUNGI AND MYCOTOXINS

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Abstract

The present study was undertaken on two hundreds samples (fifty of frozen meat samples and 30 of each of minced meat, basterma, hamburger, luncheon and sausage) were subjected for mycological examination as well as detection of aflatoxins. All samples were contaminated with moulds. The higher rate of moulds contamination was recovered from basterma and sausage samples followed by hamburger, then luncheon, minced meat and lower rate of contamination was reported in frozen meat. Aspergillus spp. were at the top of all other fungi isolated, followed by Penicillium spp., then Mucor spp., Alternaria spp., Cladosporium spp., Rhizopus spp., Geotrichum spp., Paecilomyces spp., Trichoderma spp., Scopulariopsis spp. and Curvularia spp. The incidence of yeast contamination was highest in sausage samples, followed by basterma, then hamburger, luncheon, minced meat and the frozen meat samples showed the lowest rate of contamination. Candida spp were the most prevalent yeasts in samples. Other species of yeasts were also recovered including, Torulopsis spp., Rhodotorula spp., Trichosporon spp., Saccharomyces and Debaryomyces. The higher levels of aflatoxin residues were detected in (46.66%) of sausage samples, followed by hamburger (40%), basterma (33.33%), luncheon (26.66%), minced meat (20%) and frozen meat samples (13.33%). The aflatoxins residues which detected in positive samples were B1, B2, G1 and G2 with maximum levels of 29.95 ppb, 18.55 ppb, 14.89 ppb, 14.50 ppb, 8.52 ppb and 5 ppb in sausage, basterma, hamburger, luncheon, minced meat and frozen meat respectively. The effect of heat treatment on aflatoxin B1 stability in meat was investigated, where the combination of boiling and frying methods had the higher percentages of reduction of aflatoxins content (33.25%), followed by frying (19.02%), boiling (14.25%) and roasting reduced only (11.18%) of toxin level. Application of gamma irradiation (doses 1, 3 and 5 Kgy) had no effect in detoxification of AFB1, but the doses of 7 Kgy was highly effective. Adding of potassium sorbate (1%) to the contaminated meat was highly effective in decontamination of moulds but the lower concentration than 1% had no effect. Garlic was found to have the highest antifungal effect among the examined natural wild herbs.

Keywords
frozen meat, aflatoxins, Penicillium, Torulopsis, Rhodotorula,