Effects of marinating on the formation of polycyclic aromatic hydrocarbons (benzo[a]pyrene, benzo[b]fluoranthene and fluoranthene) in grilled beef meat

Abstract

The study was conducted to investigate the effect of marinating on the generation of polycyclic aromatic hydrocarbons (benzo[a]pyrene, benzo[b]fluoranthene and fluoranthene) in grilled beef meat. Seven marinade treatments containing 1) basic marinade, which include sugar, water, onion, turmeric, lemon grass, salt, garlic, coriander and cinnamon, 2) basic-oil, 3) Commercial marinade. 4) basic-oil-lemon juice, 5) basic-lemon juice, 6) basic-oil-tamarind and 7) commercial-tamarind at four time intervals (0, 4, 8 and 12. h) were applied on meat samples before charcoal grilling. Tandem solid-phase extraction (SPE) was used to clean up the samples. A high performance liquid chromatography (HPLC) with fluorescence detector was used for PAHs analysis. The study showed significant ($p< 0.05$) reduction (70%) of PAH in beef samples treated with the acidic marinade (containing 1.2% lemon juice). The basic-lemon > basic > basic-oil-lemon > basic-oil was the best order of marinade treatment. The duration of marinating was not a significant ($p> 0.05$) factor in PAH reduction.