

Abstract

Proximate analysis, expressible water(EP), water holding capacity (WHC), pH value, total acidity, free fatty acids (FFA), thiobarbituric acid values (TBA), and microbiological examination were determined in order to evaluate the effect of packaging materials and treatments in addition to spice extracts on the shelf life of buffalo meat product stored for nine months under frozen condition. The samples were treated by spice extracts and packaged in two packaging materials low density polyethylene (LDPE) bags without vacuum, and laminated polyethylene/nylon bags under vacuum. The data showed that all the samples have expressed moisture loss during the 9 months storage period. The moisture loss and the (EP) were higher in the (LDPE) packaged samples, whereas, (WHC) values decreased with time during storage for all samples. The samples indicated an increase in the acidity values and a reduction in the pH values especially for the first four months of storage period. These changes were associated with an increase in the (FFA) values. The control samples showed the lowest pH value compared with the others, and this indicated the effect of natural antioxidants to retard the formation of (FFA). The (TBA) values for the control samples were higher than those packaged under vacuum or treated by spice extracts. Storage time had negative effect on the total bacterial counts and the coliform group for all samples. The rate of reduction was much higher in the vacuum packaged samples and the spice extracts treated samples as well especially those treated by black cumin extracts than the untreated or samples packaged without vacuum.

Key words: vacuum packaging, spice extracts, buffalo meat, frozen storage