

PDF - EFFECT OF CO-EXTRUDED FILM ON THE SHELF STABILITY OF SLICED SALTED PORK MEAT PRODUCT - researchcub.info ABSTRACT

The study evaluated the efficiency of co-extruded polypropylene (PP) and low density polyethylene (LDPE) in extending the shelf-stability of unam in untraditional meat product during storage under ambient conditions. Fresh pork was processed, in traditional way, into unam in un meat product and stored for 6 months, under ambient room conditions as unpackaged, clay pot packaged (traditional method), and those packaged in polypropylene (PP), low density polyethylene (LDPE) and co-extruded polypropylene/low density polyethylene (PP/LDPE). Samples were withdrawn at intervals of one month for evaluation of quality changes. Results show that the storage room temperature (25.95-27.91°C) and relative humidity (68.25-77.42%) are suggestive of typical diurnal conditions during the beginning of rainy season in South Eastern States of Nigeria. Relative humidity (RH) which was 69.55% at the beginning of storage reduced to 68.29% in the 2nd month of storage and subsequently increased thereafter to 77.42% in the 5th month of storage. Due to increasing RH from the second month of storage, all products increased in moisture content, consequently leading to increases in water activity and reduction in crude protein, fat and salt content due to dilution effect resulting from mass action. These changes were greater in the unpackaged and clay pot packaged samples due to greater access to air and moisture but least in the PP/LDPE coextruded film due to greater restriction to air and moisture transmission. Owing to increasing moisture and water activity from the second month of storage, protein hydrolysis became the dominant protein deteriorative reaction, leading to increases in protein solubility and pH, particularly in the unpackaged but significantly least in the PP/LDPE co-extruded plastic film. Thiobarbituric acid reactive substances (TBARS) and free fatty acids (FFA) results suggest that both oxidative and hydrolytic rancidity were occurring in the samples but the extent was very low and did not lead to detectable rancidity in any sample.

The reactions of the antioxidant vitamins (A, C and E) must have been effective in preventing detectable rancidity, as they all have significant ($p < 0.05$) correlations { $r(\text{Vitamin C/TBARS}) = -0.743$, $r(\text{Vitamin C/FFA}) = -0.586$, $r(\text{Vitamin A/TBARS}) = -0.882$, $r(\text{Vitamin A/FFA}) = -0.794$, $r(\text{Vitamin E/TBARS}) = -0.753$ and $r(\text{Vitamin E/FFA}) = -0.831$ }. All the vitamins continued to reduce during storage. Total viable count and mould count significantly ($p < 0.05$) increased in the unpackaged samples throughout storage period presumably due to greater access to moisture and air. These counts reduced in the plastic film packages, particularly PP/LDPE package, probably due to restricted/lower availability of oxygen and moisture. Although all the sensory attributes slightly reduced during storage, the reductions did not lead to significant loss of acceptability. All deteriorative reactions/changes were more adverse in the unpackaged samples and clay pot packaged samples compared co-extruded PP/LDPE packaged samples. Thus, unam in un packaged with co-extruded PP/LDPE plastic film is acceptable up to 6 months of storage at ambient room conditions without much loss in quality. On the other hand, the unpackaged and clay pot packaged samples showed much instability and spoilage that they were discarded after about 3 and 5 months respectively.

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