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

The study evaluated the efficiency of co-extrudedpolypropylene (PP) and low density polyethylene (LDPE) in extending the shelf-stability of unam inungtraditional meat product during storage under ambient conditions. Fresh pork was processed, in traditionalway, into unam inung meat product and stored for 6 months, under ambient roomconditions as unpackaged, clay pot packaged (traditional method), and thosepackaged in polypropylene (PP), low density polyethylene (LDPE) and co-extrudedpolypropylene/low density polyethylene (PP/LDPE). Samples were withdrawn atintervals of one month for evaluation of quality changes. Results show that thestorage room temperature (25.95-27.91oC) and relative humidity (68.25-77.42%)are suggestive of typical diurnal conditions during the beginning of rainyseason in South Eastern States of Nigeria. Relative humidity (RH) which was69.55% at the beginning of storage reduced to 68.29% in the 2nd month ofstorage and subsequently increased thereafter to 77.42% in the 5th month ofstorage. Due to increasing RH from the second month of storage, all productsincreased in moisture content, consequently leading to increases in wateractivity and reduction in crude protein, fat and salt content due to dilutioneffect resulting from mass action. These changes were greater in the unpackagedand clay pot packaged samples due to greater access to air and moisture butleast in the PP/LDPE coextruded film due to greater restriction to air andmoisture transmission. Owing to increasing moisture and water activity from thesecond month of storage, protein hydrolysis became the dominant proteindeteriorative reaction, leading to increases in protein solubility and pH,particularly in the unpackaged but significantly least in the PP/LDPE co-extrudedplastic film. Thiobarbituric acid reactive substances (TBARS) and free fattyacids (FFA) results suggest that both oxidative and hydrolytic rancidity wereoccurring in the samples but the extent was very low and did not lead todetectable rancidity in any sample.

The reactions of the antioxidant vitamins (A,C and E) musthave been effective in preventing detectable rancidity, as they all havesignificant ($p<0.05$) correlations {r(Vitamin C/TBARS) = -0.743, r(Vitamin C/FFA) = -0.586, r(VitaminA/TBARS) = -0.882, r(Vitamin A/FFA) = – 0.794, r(Vitamin E/TBARS) = -0.753 andr(Vitamin E/FFA) = -0.831}. All the vitamins continued to reduce duringstorage. Total viable count and mould count significantly ($p<0.05$) increasedin the unpackaged samples throughout storage period presumably dueto 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, thereductions did not lead to significant loss of acceptability. All deteriorativereactions/changes were more adverse in the unpackaged samples and clay potpackaged samples compared co-extruded PP/LDPE packaged samples. Thus, unaminung packaged with co-extruded PP/LDPE plastic film is acceptable up to 6months of storage at ambient room conditions without much loss in quality. Onthe other hand, the unpackaged and clay pot packaged samples showed muchinstability and spoilage that they were discarded after about 3 and 5 monthsrespectively.

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