

Effect of Gamma Radiation, Age of Paddy, Rice Variety and Packaging Materials on the Surface Free Fatty Acid Content of Brown Rice

Authors : Zenaida M. De Guzman, Davison T. Baldos, Gilberto T. Diano, Jeff Darren G. Valdez, Levelyn Mitos Tolentino, Gina B. Abrera, Ma. Lucia Cobar, Cristina Gragasin

Abstract : One of the factors affecting the quality of brown rice is the free fatty acid produced from surface lipids. It is the purpose of the study to determine the effect of gamma radiation, packaging materials and age and variety of paddy on the surface free fatty acid content using two different brown rice variety, namely, RC-160 and SL-7, packed in two different packaging materials, namely, regular polyethylene bag and Super bag irradiated at 0.5 and 1.0 kGy. Brown rice was produced from 2-week old (Lot 1) and two months old paddy (Lot 2) and irradiated at the Co-60 Multipurpose Irradiation Facility, PNRI. The surface Free Fatty Acid (FFA) content was obtained following the AOCS Official Method (1982) with some modifications. The experiment was laid out using Split-Plot Randomized Control Block Design. Analysis of variance (ANOVA) showed that the effects of variety, age of paddy and interactions of both were both significant. The surface FFA of SL-7 variety was found to be significantly higher than the RC-160 variety for all radiation doses. Likewise, Lot 2 was observed to have higher surface FFA than Lot 1 regardless of packaging material and radiation dose. It was observed that the surface FFA of both varieties packed in both packaging materials increased significantly up to the 2nd or 3rd month of storage and remains the same until the 5th month. On the other hand, radiation dose did not significantly affect the surface free fatty acid content for all storage/sampling time while the packaging material significantly interacts with the type of variety and radiation dose. Gamma radiation was proven to have no significant effect on the surface free fatty acid at 0.5 and 1.0 kGy and further analyses are needed to determine the action of gamma radiation to the activity of enzyme (lipase-induced and microbial) responsible for the production of other lipolytic products and the effect of gamma radiation on the integrity of the packaging materials.

Keywords : brown rice, free fatty acid, gamma radiation, polyethylene bag

Conference Title : ICAFST 2016 : International Conference on Agriculture Food Science and Technology

Conference Location : London, United Kingdom

Conference Dates : November 24-25, 2016