

## **Gamma irradiation of corn starches with different amylose-to-amylopectin ratio**

### **ABSTRACT**

Corn starches with different amylose-to-amylopectin ratio (waxy, normal, Hylon V, and Hylon VII) were treated with five doses of gamma irradiation (1, 5, 10, 25, and 50 kGy). The effects of gamma irradiation on the physicochemical properties of starch samples were investigated. Waxy samples showed an increase of amylose-like fractions when irradiated at 10 kGy. The reduction in apparent amylose content increased with amylose content when underwent irradiation at 25 and 50 kGy. Low amylose starches lost their pasting ability when irradiated at 25 and 50 kGy. Results from thermal behavior and pasting profile suggested that low level of cross-linking occurred in Hylon VII samples irradiated at 5 kGy. Severe reduction in pasting properties, gelatinization temperatures and relative crystallinity with increasing irradiation intensity revealed that waxy samples were affected more by gamma irradiation; this also indicated amylopectin was the starch fraction most affected by gamma irradiation. Alteration level was portrayed differently when different kind of physicochemical properties were investigated, in which the pasting properties and crystallinity of starches were more immensely influenced by gamma irradiation while thermal behavior was less affected. Despite the irradiation level, the morphology and crystal pattern of starch granules were found remain unchanged by irradiation.