Title Effects of controlled atmosphere storage and low-dose irradiation on potato tuber components affecting acrylamide and color formations upon frying

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Abstract

The effects of normal and controlled atmosphere combinations on tuber components responsible for acrylamide formation were studied during prolonged storage at 9±1 °C using the tubers of "Agria" and "Russet Burbank." The effects of low-dose irradiation (50, 200 Gy) prior to normal atmosphere storage were also studied. There was only a limited increase in the concentrations of sugars during 6 month of storage under normal atmosphere conditions. Low-dose irradiation slightly decreased the rate of sweetening in the tubers. The potential of acrylamide formation remained almost the same; however, the loss of firmness became clearer during 6 month of storage under normal atmosphere conditions. Controlled atmosphere storage in which O_2 was deficient to a sufficient respiration increased the concentrations of sugars, and thus, the potential of acrylamide formation in potatoes upon frying at 170 °C for 10 min. The sum of glucose and fructose concentrations showed a good correlation ($r^2 \sim 0.90$) with the potential of acrylamide formation for both cultivars.