B-110: Biochemical changes of potato tubers during reconditioning

D C K Illeperuma[1] , T Solomos[2]
([1]*Dept of Food Science & Technology, Faculty of Agricultute, University of Peradeniya,* [2]*University of Maryland, College Park, U.S.A.*)

Storage of potato tubers at low temperature provides conditions for long-term storage by delaying sprouting, reducing microbial spoilage and weight loss. However, potato tubers undergo a phenomenon known as "sweetening" during storage at 1-4°C which results in poor quality processed potato products. Transfer of potato tubers to non-chilling temperatures after storage at low temperatures causes conversion of accumulated sugars to starch. The present study was conducted to study the biochemical changes of tubers on the transfer from 1°C to 10°C in air and 2.5 % O_2.

The potato tubers were stored at 1°C for 28 days and reconditioned at 10°C for 2 months in air and 2.5 % 0_2. Changes in concentrations of sucrose, fructose and glucose during reconditioning at 10°C were monitored by high performance liquid chromatography. Rate of respiration and the changes in the activities of sucrose synthase (SS), sucrose phosphate synthase (SPS) and invertase during reconditioning were also determined. There was an increase in CO_2 evolution and SS activity on transferring potatoes from 1°C to 10°C, associated with a decline in the sugar levels, SPS and invertase activities. Low oxygen concentration reduced the rate of decline in the sugars and rise in SS activity while it did not affect the changes in SPS and invertase activities. The change in SPS activity was not due to coarse control, but may he due to changes in its kinetic properties or post-transnational modifications. Russet Burbank potato tubers can be reconditioned in air after low temperature storage.