

**Title** Variation of total FOS, total IOS, inulin and their related-metabolizing enzymes in burdock roots (*Arctium lappa* L.) stored under different temperatures

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### **Abstract**

Burdock roots were stored for six weeks at three temperatures, 0, 15 and 20 °C, and activity of sucrose hydrolase (SH), 1-kestose hydrolase (1-KH), inulin hydrolase (InH), sucrose:sucrose 1-fructosyltransferase (1-SST) and fructan:fructan 1-fructosyltransferase (1-FFT) were assessed. Simultaneously, total fructooligosaccharides (FOS), total inulooligosaccharides (IOS) and inulin were also assessed during storage. During storage, SH showed an irregular variation at 15 and 20 °C, and was significantly higher at 0 °C showing a continuous increase during the storage period. 1-KH decreased progressively at 15 and 20 °C, but showed a sharp increase at 0 °C after two weeks and decreased afterwards. InH showed a different although more regular pattern by decreasing progressively at 0, 15 and 20 °C. However, the decrease was more significant at 15 and 20 °C during the first two weeks, while at 0 °C the decrease was significant after four weeks storage. 1-SST and 1-FFT activities decreased progressively in a pseudo-linear regression during storage, and showed similar patterns. At 15 and 20 °C, total FOS increased during the first three weeks then decreased, while at 0 °C FOS increased progressively during storage. Total IOS increased during storage, however, this increase was much higher at 0 °C than that observed at 15 and 20 °C. Inulin content decreased during storage and final content was lower at 20 °C. The inulin to total FOS plus total IOS ratio decreased sharply during the first two weeks of storage, then progressively during the last four weeks, while the ratio of hydrolyzing to synthesizing activities was quite stable at 15 and 20 °C, but showed a peak at 0 °C after two weeks. The results suggest that carbohydrate metabolism in stored burdock depends partly on temperature and other physiological factors.