

**Title** Effect of L-ascorbic acid, sugar, pectin and freeze–thaw treatment on polyphenol content of frozen strawberries

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### Abstract

The stability of phenolic compounds of three strawberry cultivars was evaluated for changes during prefreezing treatments, storage and various freezing and thawing conditions. Polyphenol content was determined by HPLC–DAD–FL. The sum of assayed polyphenolic (proanthocyanidin and monomeric flavan-3-ols, anthocyanins, ellagic acid, *p*-coumaric acid) represented 2858.4 mg/kg in Kent, 2893.1 mg/kg in Elkat, and 2438.0 mg/kg in Senga Sengana. After freezing, 4.5–33.6% of polyphenols were lost; protective effects of prefreezing treatments were seen on anthocyanidins and proanthocyanidins: ascorbic acid was the most effective pretreatment, allowing retention of 3.9–27.5% of anthocyanins, and almost total recovery (3.9–23.9%) when associated with liquid nitrogen freezing. Pectin and sugar only allowed retention of 3.0–25.1% and 5.5–25.4% of the anthocyanins, respectively. Thawing of the strawberries in a microwave oven (instead of 20 h at 20 °C) had a further positive effect on retention of anthocyanins, proanthocyanins, (+)-catechin and ellagic acid.