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Antioxidant Content of Carrots with Different Pigments Grown in Ontario, Canada

¹Chanli Hu, ²Rong Tsao, and ¹Mary Ruth McDonald

¹Department of Plant Agriculture, University of Guelph, Muck Crops Research Station, Kettleby Ontario, L0G 1J0, Canada
Agriculture and Agri-Food Canada, Guelph, Ontario, N1G 4S9, Canada

Carrots provide important nutrients in the human diet. Orange carrots are a major source of beta carotene, a pigment with antioxidant activity that is the precursor to vitamin A. Carrots with different pigments and colours are now commercially available. To determine the relative antioxidant content of carrots with different pigments, cultivars of a purple, red, orange, yellow and white carrot were selected and compared to breeding lines from the USDA carrot breeding program at the University of Wisconsin. All were tested for total antioxidant activity (TAC) and total phenolic content (TPC). The Folin-Ciocalteu method was used to determine total phenolic content (TPC). A standard curve was generated with gallic acid, with a concentration range from 0 to 100 µg/ml (0-100 ppm), from which TPCs in the various fractions were calculated and expressed as milligrams of gallic acid equivalent per gram of dry weight. The antioxidant activity was determined using 2,2-diphenyl-1-picrylhydrazyl radical (DPPH·) induced free radical assay and the Ferric Reducing Antioxidant Power (FRAP) Assay. Significant differences were found for total phenolic content and total antioxidant activity. Cultivar Purple Rain had significantly higher TPC than all other carrots, except breeding line Red-104-3. The FRAP test showed that Purple Rain had a higher antioxidant level than Crème de Lite, a white carrot. When carrots were grouped by color, the purple carrots had significantly higher TPC than the yellow and white carrots and higher TAC than the yellow carrots.