

Abstract

Tomatoes (*Lycopersicon esculentum*, Mill. cv. Capita F1) were harvested at different ripening stages. Spectral images from 400 to 700 nm with a resolution of 1 nm were recorded. After recording, samples were taken from the fruit wall and the lycopene, lutein, β -carotene, chlorophyll-a and chlorophyll-b concentrations were measured using HPLC. The relation between the compound concentrations measured with HPLC and the spectral images was analyzed using partial least squares (PLS) regression. The Q^2 error of the predicted lycopene concentration, determined from the PLS procedure, was 0.95 on a pixel basis, and 0.96 on a tomato basis. The Q^2 error of the other compounds varied from 0.73 to 0.84. Pixel-based regression made it possible to construct concentration images of the tomatoes, which showed non-uniform ripening. The method can be applied in a conveyor belt system using sorting criteria such as concentration of the compounds and the uniformity of the distribution of the concentrations.