

Abstract

A simple and rapid method has been developed for determination of carotene content in carrots by color image analysis. We focused our attention on determination of the carotene content using the color images of the carrot acquired by a digital camera, because such method is one of the easiest, rapid and cheapest ways. Thirty-three carrots of twenty varieties were prepared as samples. The digital color images of the cut sections of the center part of the sample carrots were collected by using a color image acquisition system which composes of a digital camera, a fluorescent light at a 5500 K color temperature, a diffuse reflector and so on. We then obtained the average values of the R (Red), G (Green) and B (Blue) ones in the RGB color space and calculated the Y (Brightness) value. We also calculated the averages of the *H* (hue), *S* (Saturation) and *L* (Lightness) values in the HSL color space. Additionally, we performed the simple nonlinear analysis by the Grouping Method of Data Handling for determining the relationship between the carotene content obtained by the HPLC method and the color information. Results show that both r^2 (coefficient of determination) and Q^2 (prediction coefficient of determination) were higher than 0.77 and 0.69, respectively. This study represents an important step in the development of the simple and rapid determination of the pigment content in agricultural products by the color image analysis using the digital camera.