

Title Electronic nose as a non-destructive tool to characterise peach cultivars and to monitor their ripening stage during shelf-life

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Abstract

A commercial electronic nose (PEN 2, Win Muster Airsense) was used to classify four peach cultivars and to assess the ripening stage during shelf-life. Principal component analysis (PCA) and linear discriminant analysis (LDA) were used to investigate whether the electronic nose was able to distinguish among four diverse cultivars. PCA applied on the electronic nose data, collected during shelf-life from harvest until senescence, highlighted the ability of the instrument to assess the ripening stage of peaches. The loading analysis identified one sensor as the only relevant one in the discrimination of peaches on the basis of their shelf-life. The responses of the sensor were plotted against time and fitted with a sigmoid transition function allowing the definition of three different ripening stages (unripe, ripe, over-ripe) based on the trend of first and second time derivatives. Classification and regression tree (CART) analysis was applied to characterise peach samples into the three classes. The performance of the electronic nose was compared with the results of classical and non-destructive techniques such as ethylene measurement and colour evaluation, frequently used to assess the ripening stage of climacteric fruit.