

Title Monitoring of physical–chemical and microbiological changes in fresh pork meat under cold storage by means of a potentiometric electronic tongue

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Abstract

This work describes the correlation found along 10 days between potentiometric measurements obtained by using an electronictongue and the variation in certain physicochemical, microbial and biochemical parameters measured on a whole piece of pork loin stored under refrigeration. The electronictongue consists of a set of six electrodes made of Au, Ag, Cu, Pb, Zn and C, and a reference electrode. Through the use of various multivariate analysis techniques, such as: PCA and two types of artificial neural networks (i.e. multilayer perceptron (MLP) and fuzzy ARTMAP) it was found that it is possible to determine the time elapsed in relation to the degradation of the loin by using simple potentiometric measurements. Additionally, in the same pork sample used to measure redox potentials with the electronictongue, the following parameters were also determined; pH, microbial count, concentrations of inosine 5'-monophosphate (IMP), inosine (Ino) and hypoxanthine (Hx). Through the use of PLS analysis, it was found a rather good correlation between pH and the potentiometric data. Also a remarkable correlation was observed between the measures carried out with the electronictongue and the so-called *K*-index that simultaneously measures the variation in the adenosine triphosphate (ATP) degradation products. These results suggest that this simple, or a similar electronictongue, could be useful for the undemanding qualitative or semi-quantitative evaluation of freshness in meat samples in a wide range of situations.