Canonical correlation for characterize relation between sensory panel and electronic nose, using different bovine muscles

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Abstract

In recent years, consumers have demanded meat products that are safe, nutritious, convenient, rich in variety, attractive and innovative. Meat quality depends on organoleptic properties, such as color, texture, odors, flavor and juiciness. To characterize different muscles, odor and flavor parameters were determined. Muscle effects were observed for electronic nose and a sensory panel. Measurements of meat quality traits are traditionally determinate by sensory panel evaluation, which is complicated due to the interaction of physical and sensory processes. Sensory evaluations are labor intensive, time consuming and expensive. Volatile compounds released from foods are closely related to their aroma and can be determined to monitor their quality and safety. During cooking, thermally induced reactions occur resulting in the characteristic aroma of meat. Different artificial electronic nose devices have developed to discriminate complex vapor mixtures containing many different types of volatile organic compounds. These devices comprise several sensor types including metal oxide, semi conductive polymer, conductive electroactive polymers, optical, surface acoustics waves, and electrochemical gas sensors. The aim of the present research was to characterize the relation between, sensory panel and electronic nose in different bovine muscles. Each panel member evaluated two random cubes of each steak in a booth supplied with green light (ISO 8589, 1988). Panel members were provided with an evaluation form, salt free crackers and distilled water to rinse the palate. The description and the intensity off-flavors on a 9-point scale (0= none, 1=extremely slight off-flavor to 8= intense off-flavor). An electronic nose system α-PROMETHEUS (Alpha MOS, Toulouse, France) was used. The sensor array system (α -FOX 4000, France) contains eighteen metal oxide sensors: six LY ((LY2/AA, LY2/G, LY2/gCT, LY2/gCTI, LY2/Gh, LY2/LG); seven P (P10/1, P10/2, P30/1, P30/2, P40/1, P40/2, PA2) and five T (T30/1, T40/2, T40/1, TA2, T70/2)). Principal components analysis was applied on data to describe the relation between variables and their influence among muscles using the statistical software InfoStat. The relation between electronic nose data and aroma and beef flavor were also evaluated by Canonical Correlation procedure. One Canonical correlation could be sufficient to describe the relation between sensory panel and electronic noise.

Keywords: electronic nose, sensory panel, principal component, canonical correlation.