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**Influence of different climatic conditions on the sensory quality of apples**

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Among factors affecting fruit quality, altitude is one of the most important, determining differences in physiological mechanisms of fruit growth, ripening stage and chemical composition, as demonstrated by several studies. However, very few studies deal with the impact on perceivable quality. In this work a detailed protocol for sensory and instrumental profiling of apples [1] is proposed to study the sensory differences between fruit grown in different climatic conditions.

Golden Delicious apples were harvested at three harvest times, from six orchards located in Val Venosta area (Alto Adige, Italy) in a range of 20km from each other, at two altitudes (600 and 1000m a.s.l.). Fruit were analysed by a trained panel (17 judges), through the quantitative descriptive method based on a vocabulary of 23 attributes for odour, texture and flavour. Instrumental analyses were also performed, by measuring mechanical and acoustic response at texture analyser [2], basic chemical composition and cell anatomy by microscopy [3].

Although the sensory profiles were mainly affected by time of harvest, differences were also found in relation to the altitude. In particular, fruit from low altitude were described as juicier, crunchier and more fibrous than samples from high altitude, which were more floury and grainy. Instrumental analyses confirmed the sensory description. Moreover, anatomical data showed that fruit from low altitude had higher volume, a higher amount of cells and higher percentage of intercellular spaces. These differences can be referred to differences in cell division mechanism during fruit growth, and are related to the better texture performances observed in low altitude fruit.

The results, even if preliminary and limited to one apple variety, suggest that differences between fruit from various altitudes can be perceivable by human senses and are related to texture properties. Therefore, the proposed sensory-instrumental tool can be applied to describe such differences.

References:

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[2] Costa et al., 2011. *Postharvest Biol. Tec.* 61:21–28.

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