Title Understanding the sensory characteristics of fresh and processed tomatoes using descriptive sensory analysis

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Abstract

Three studies, using descriptive sensory analysis with highly trained panelists, were conducted to better understand the sensory characteristics of fresh and processed tomatoes.

A "green" note often has been described as part of tomato flavor and is noted in many fruits, vegetables, grains and processed products. Thus, the first study developed a sensory lexicon for green characteristics in foods. The lexicon, consisting of 17 sensory attributes, was used to characterize sensory properties of 22 chemicals potentially associated with green odor. Green characteristics can be differentiated as green-unripe, green-peapod, green-grassy/leafy, green-viney and green-fruity. Additional attributes that are important in various green characteristics included musty/earthy, pungent, bitter, sweet and floral. Various chemicals were described as green at different concentrations. Green-grassy/leafy was the most common characterizing green attribute of many of the chemicals studied. Changing the concentrations of the chemicals resulted not only in changing the intensity of the attributes, but it also altered the sensory profile of many of the chemicals.

A sensory lexicon for describing tomatoes also was developed. A variety of fresh tomatoes, processed tomatoes, and tomato-based products such as ketchup and pasta sauce were used to create the lexicon. The characteristics of tomatoes can be described using 33 aroma, flavor and texture attributes. Some characteristics were common across all or most fresh and processed tomatoes. However, reducing the number of attributes may be possible for certain studies because some attributes were appropriate only for fresh or processed tomatoes, not both.

A third study determined the sensory characteristics of five tomato types, including newer and older cultivars that varied in their physical traits and primary use. The impacts of processing on the sensory quality of tomato products were investigated, with juice (minimal processing) and paste (higher level of processing) being made from the cultivars. Fresh tomatoes differed significantly because of cultivar and ripening stage differences. Fresh tomatoes differed considerably from processed tomatoes. A low processing level intensified some key aroma and flavor attributes, but differences in flavor attributed

to cultivar became minimal after a higher degree of processing. Textural differences among cultivars after processing were more pronounced than flavor differences.