

## **A Metabolomics Approach to the Volatile Compound Profiles of Raw and Roasted Peanuts**

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The flavor of roasted peanuts has been attributed primarily to the volatile compounds found using conventional gas chromatography usually in tandem with quadrupole mass spectrometry. The compounds that were found in the largest concentrations, such as the pyrazines have been theorized to be the most important. Model systems prepared using these compounds did not reproduce roasted peanut flavor. Using time of flight mass spectrometry coupled with two dimensional gas chromatography, more detailed profiles were produced from samples of both runner and virginia peanut cultivars. As a metabolomics based approach, this study gathered a wide range of data for identification and fold changes between samples and treatments rather than targeting specific compounds and attempting to quantify them.

From the analysis, 361 distinct compounds were positively identified. Principle Component analysis of the data showed distinct groupings between the cultivars and between the raw and the roasted samples of each cultivar. Although a number of pyrazine compounds were found, larger numbers of smaller aldehydes, furans and ketones as well as other types of compounds were reported in the roasted peanuts but not in the raw. Typically these compound are furans and aldehydes rather than pyrazines. This study gives information about the volatile compounds that are responsible for roasted peanut flavor as well as those that are linked to the differences in flavor of runner and virgina peanuts. Determining the pathways to the creation of these compounds would allow for links to genetic markers to maintain and improve peanut flavor.