Phenotyping Peanut Seed Composition.

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Determination of the composition of peanut seed combines many aspects of conventional food analysis, but despite the need for accurate, yet low cost and rapid methods, most of this work is still labor intensive and relies on expensive, specialized equipment. The most successful rapid methods have been developed for proximate composition; especially total fat, protein and moisture. Chromatography, both liquid and gas, has been used with the most success for lipid composition, fat soluble vitamins, smaller carbohydrates such as sugars, small molecule phenolic compounds and to a lesser extent, water soluble vitamins. The addition of mass detectors has led to more metabolomic approaches, where multiple analytes can be determined at one time, however quantification remains a challenge. The peanut matrix has proven to be a challenge due to interference from both high protein and lipid levels with methods of analysis and enumeration. Accurate results for most methods still require skilled analysts for sample preparation, operation of high cost equipment and interpretation of data produced. To date, there have been approaches that have been successful, but some components remain problematical. Accurate phenotyping of seed components is always related to the particular seed subjected to analysis because of the effect of environment, maturity, handling, and seed size. In relating genotyping information, such as genomic markers, to phenotype of seed components requires careful sample selection as demonstrated in data on high oleic markers vs the high oleic trait in immature seed.