Measurements of High Oleic Purity in Peanut Lots Using Rapid, Single Kernel Near Infrared Reflectance Spectroscopy

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High oleic peanuts have an improved post-roast shelf life versus normal oleic peanuts. High oleic purity (percentage of high oleic peanuts in a lot) is critical to ingredient performance, and hence the value of high oleic peanut lots. Contamination (percentage of non-high oleic peanuts within a lot) can result from accidental mix ups at the breeder/seed level, improper handling through the production chain, or due to physiologically immature high oleic kernels that do not meet established thresholds in oil chemistry to be true high oleic peanuts. Therefore, industry has established purity requirements to monitor and control contamination in high oleic lots. Sample size will impact the accuracy and variability of high oleic purity measurements when using samples to estimate the purity of bulk lots. Increasing the sample size will decrease the variability among replicated sample test results and increase the accuracy of the estimated lot purity. To allow for larger sample sizes, a rapid, robust instrument based upon near infrared technology was used for purity measurements. The objectives of this study were to (1) assess the performance of this device to accurately predict the high oleic purity of artificially mixed peanut lots at different contamination rates and (2) assess the impact of sample size on the precision of purity measurements. Three grades of “mini-lots” each at seven different contamination rates (0, 5, 10, 20, 30, 50, and 100 %) were prepared. High oleic purity of samples was assessed by scanning (20 kernels per second) multiple (8 replications) 500 gram samples with near infrared reflectance spectroscopy using a QualySense Qsorter Explorer sorting device. Using variability and distributional measurements among sample test results, operating characteristic curves were calculated to evaluate the performance of oleic sampling plan designs. The impact of sample size (from 500+ kernels to 10 kernels) and lot contamination on returned purity values is discussed in context of binomial statistics.