Since the early 1990s, the peanut breeding program at N.C. State University has monitored flavor of advanced breeding lines so that flavor could be used as a criterion in cultivar release decisions. The number of samples that can be assayed for flavor in a year are limited, so only advanced breeding lines have been monitored. As data have accumulated, lines with superior flavor profiles have been retained. The NCSU flavor database was mined to calculate the response of flavor attributes to selection over time, genetic gain or $\Delta G$. Data on virginia-type cultivars, NCSU breeding lines tested for at least two years, and flavor standards Florunner and Georgia Green were analyzed and means computed, adjusted for appropriate covariates (linear and quadratic effects of roast color and intensity of the fruity attribute that can interfere with the perception of roasted peanut and sweet sensory attributes). In order to relate sensory attribute response to time, each genotype was characterized as to the first year it was subjected to replicated testing of yield and grade. Regression of the intensities of sensory attributes on time revealed that $\Delta G$ has been greater in magnitude for the breeding lines developed in the late 1990s through the 2000s than it was for cultivars released from 1979 through 2005 (first tested 1974 through 2000). The response of breeding lines was +0.046 flavor intensity units (fiu) for roasted peanut, +0.58 fiu for sweet, and -0.032 fiu for bitter, compared with values of +0.008, +0.005, and -0.005 for the cultivars.

We attribute this accelerated rate of gain for flavor to our program of regular monitoring of the flavor of advanced lines.