Abstract

In studies with trained and untrained participants, we have demonstrated that people can discriminate differences in texture between apples that differ by more than ~ 5 N in instrumental puncture tests [Harker, F.R., Gunson, F.A., Brookfield, P.L., White, A., 2002a. An apple a day: the influence of memory of consumer judgement of quality. Food Qual. Prefer. 13, 173–179; Harker, F.R., Maindonald, J., Murray, S.H., Gunson, F.A., Hallett, I.C., Walker, S.B., 2002b. Sensory interpretation of instrumental measurements 1: texture of apple fruit. Postharvest Biol. Technol. 24, 225–239]. Using this information, it is possible to estimate the probability that a consumer will perceive a difference between apples selected at random from two lines of fruit (e.g. apples harvested from different orchards) based on knowledge of the distribution of instrumental values in each product line. The data we present demonstrates the overwhelming impact of biological variability on attempts to use instrumental–sensory relationships to predict product quality in apples. Calculations predicted that two lines of fruit needed to differ by about 12 N (mean puncture force) in order for consumers to perceive a difference in sensory texture ($p = 0.95$). At a practical level, curves are provided to enable researchers to infer the probability with which consumers may perceive differences between apples from treatments that differ in mean puncture force.