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Dear Editor:

This letter is written to address concerns about the interpretations made by Farnham et al. (2011) regarding whether breeding has resulted in reductions in mineral content of broccoli. To assess possible mineral changes (declines) in broccoli, Farnham et al. (2011) grew in a side-by-side manner 14 commercial broccoli varieties that had been released between 1950 and 2004. They measured the concentrations of 11 minerals in each variety and reported correlations with release year and head mass. The authors conclude, “With most minerals, there was no clear relationship between concentration and release year.” They imply that for some minerals there is such a relationship, and they write, “If [the 1950 cultivar] is included, one could conclude that there has been a decline in certain mineral concentrations in broccoli from 1950 to the present.” These findings since 1950 provide the first evidence of its kind for nutrient declines in a horticultural crop. Moreover, median declines of 6 to 38% were observed—3 minerals, 2 of 5 vitamins, and protein (P = 0.002–0.014). We also found suggestive declines in ash and vitamin A (P ~ 0.2), a suggestive increase in carbohydrate (P = 0.13), and no noteworthy declines for the other vitamins. We called these findings “apparent” because of caveats about comparisons between old and new nutrient content data (Davis et al., 2004). The authors’ method eliminates the uncertainties of historical data and our need to average over a large group of foods. However, it can detect only breeding-related changes in nutrient concentrations, not changes such as dilution effects caused by intensified agricultural practices.

Results of the two studies are similar in that both found statistically significant evidence for declines since 1950 in half or more of the nutrients studied, plus probable declines in additional nutrients (Mo, Cu, and K, P = 0.06–0.18). Neither study found statistically significant or notable increases (other than carbohydrate). The broccoli study unfortunately did not include a cultivar older than 1975, limiting its statistical power. The authors might improve future studies by comparing new varieties released since 1975 with earlier cultivars.