Computerized tool takes a bite out of traditional apple testing

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The Mohr Digi-Test computerized penetrometer accurately reported crispness information for apples. Credit: Photo courtesy of Kate Evans

When it comes to apples, consumers like a crisp bite. Apple breeders know that crispness is one of the most important "sensory attributes" in apples. Because new apple varieties must be tested for these attribute before being introduced to consumers, breeders are constantly searching for methods to accurately measure traits like taste and crispness. Most breeders test the "old-fashioned" way—using panels of experts who taste-test each fruit. This method, called sensory analysis, can have a

downside; panel members can become fatigued and less accurate when scoring multiple varieties.

Testing for crispness using instruments instead of people is notoriously difficult for apple breeding programs. Currently, programs use either a fruit penetrometer—a tool used to measure a fruit's hardness—or a non-destructive method such as acoustic resonance technology. Although data acquired using these methods correlates well with attributes such as firmness, hardness, or fruit maturity, the methods are not good indicators of crispness. Therefore, most breeders still rely on human panels for testing apple crispness.

In an attempt to find an alternate method that could be practicable for screening large numbers of apples for crispness, researchers from the Tree Fruit Research and Extension Center at the Washington State University tested a new computerized penetrometer to assess firmness and texture of apples from the Washington State University's apple breeding program and 16 standard apple varieties. They then compared the instrumental data with sensory data from an expert panel. The research, published in *HortTechnology*, will be useful for apple breeders looking for ways to reduce errors and give apple-weary human testers a rest.

"The computerized penetrometer, the Mohr® Digi-Test (MDT-1), is a new tool for measuring firmness and potentially crispness", explained corresponding author Kate Evans. "In addition to the expected high correlations between the various firmness measures of the computerized penetrometer and the sensory firmness values, our data also show a significant correlation between the computerized penetrometer crispness value and the sensory crispness value, thus demonstrating the benefit from using this equipment rather than the industry standard penetrometer."

The scientists added that apple crispness has been difficult to measure instrumentally until now. "The study results showed that MDT-1 data are likely more informative than the data from either a standard penetrometer or acoustic resonance test alone", they concluded.

More information: The complete study and abstract are available on the *ASHS HortTechnology* electronic journal web site: horttech.ashspublications.org/ … t/abstract/20/6/1026

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