

How Apple Texture Influences Liking Across Age Groups

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Introduction

Apple cultivars for sustainable production should combine robustness against biotic and abiotic stress with high consumer acceptance. Among the sensory characteristics influencing acceptance, texture can be decisive. Preferences may also change with age. This study therefore compared liking of different apple cultivars in three age groups and identified the textural properties most strongly associated with acceptance. The findings aim to support consumer-oriented apple breeding and the selection of new cultivars for the market.

Results

Overall liking patterns were similar across age groups, but discrimination between cultivars increased with age (Figure 1). Children gave generally higher scores and differentiated less, whereas adults showed clearer differences. Juiciness ($r = 0.84$, $p = 0.02$) and crunchiness ($r = 0.81$, $p = 0.03$) were positively associated with liking (Figure 2). Mealiness showed a negative trend ($r = -0.72$, $p = 0.07$), while firmness was not significant ($r = 0.56$, $p = 0.19$).

Method

Seven apples (six cultivars, one breeding clone; harvest 2022) spanning a broad texture range (Figure 3) were evaluated in February 2023 after CA storage (1.5% CO₂, 1.5% O₂, 95% RH, 1°C) by 244 consumers: primary school children (n = 91), vocational students (n = 86), and adults (n = 67). A trained panel (n = 12) assessed juiciness, crunchiness, mealiness, and firmness. Mean liking was compared across age groups and correlated with sensory profiles at cultivar level (n = 7; Pearson r).

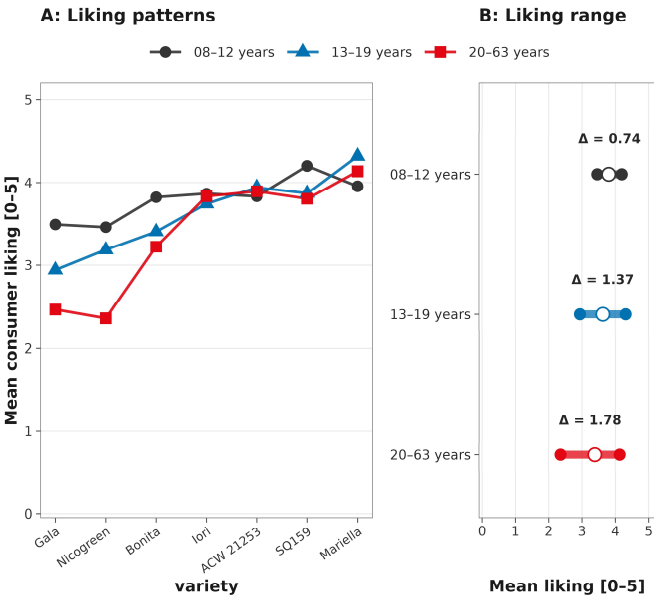


Figure 1. Observed liking patterns for the tested apple cultivars across three age groups (A) and the corresponding range of means within each age group (B).



Figure 2. Relationships between texture attributes and mean consumer liking across seven apple cultivars. Lines show linear regressions with 95% confidence intervals.

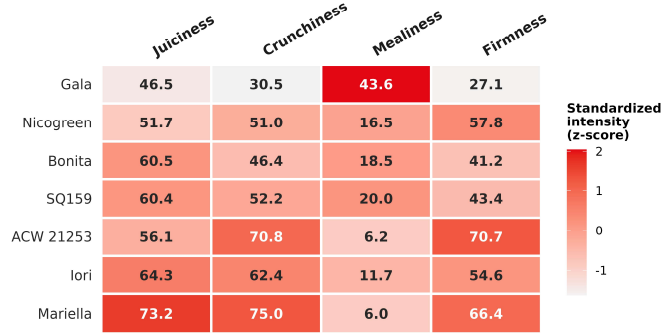


Figure 3. Texture profiles of the tested apple cultivars. Colours show standardized attribute intensities (z-scores; 0 = attribute mean); numbers indicate mean panel ratings on a 0–100 scale.

Summary

Age did not substantially change which cultivars consumers preferred, but how clearly they distinguished between them. Across all age groups, liking was more closely linked to juiciness and crunchiness than to firmness, while mealiness tended to reduce acceptance. Combining consumer and sensory testing can help select robust cultivars with agronomic benefits and high consumer appeal.