Intra-and Inter-Device Reliability of the VEGGIE METER®

PURPOSE

The purpose of this study was to examine the intra-device reliability and inter-device reliability of Veggie Meter® devices in a sample of adults at 8 sites across the United States.

VEGGIE METER®

Skin carotenoids are dietary pigments found in orange, yellow, red & dark green fruit and vegetables. The Veggie Meter® is a spectroscopy-based device that measures skin carotenoids using pressure-mediated reflection spectroscopy. It uses white LED light with slight pressure on the fingertip allowing for optical assessment of carotenoids in the skin.

PARTICIPANTS (N=279)

Average age ranged 24.7-39.0 years

♂ Males: 77 ♀ Females: 202

PROCEDURE

- Participants completed a questionnaire and surveys on demographics, skin light reactivity, and carotenoid-rich food intake
- 10 skin carotenoid scans (five pairs) were recorded on the non-dominant ring finger using two Veggie Meters® per site

INTRA-DEVICE RELIABLITY

- Intra-class correlation coefficients ranged from 0.77 to 0.99 (average 0.89), indicating good to excellent agreement within the same Veggie Meter®
- Coefficient of Variation ranged from 6.2% to 14.2% (average 8.8%)

INTER-DEVICE RELIABLITY

- Intra-class correlation coefficients between Veggie Meter® devices for a single individual ranged from 0.58 to 0.94 (average 0.81), indicating moderate to excellent agreement
- Absolute Relative Difference ranged from 7.5% to 22.0% (average 13.9%)

RECOMENDATIONS

- Using the same Veggie Meter® over time is recommended to confirm intervention effects
- Avoid servicing the Veggie Meter® mid-study to prevent data inconsistencies
- Factors like skin roughness and sun exposure can affect readings, which should be considered in further research
- Standardized calibration tools (phantoms/sticks) with known carotenoid levels are needed to ensure field accuracy
- More research is needed to refine the accuracy and use of Veggie Meter skin carotenoid scores in public health nutrition research studies

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