Supplemental Material and Methods

Lighting and Irrigation

The LED fixtures (OSRAM, Phytofy, Munich, Germany) contained white (W), red (R) (660 nm), green (G) (521 nm), and blue (B) (450 nm) LED bulbs. The spectral ratio applied to the growth area was W:R:G:B = 0:50:27:23. Light intensity was maintained at 300 µmol m^{-2} s^{-1} averaged across the growth area with a 16-hour light/8-hour dark photoperiod.

Cucurbits were grown in walk-in Percival PGW-48 chambers (Percival, Perry, IA) in 6-in pots across two shelves. Each pot was irrigated with Peters Professional 13-2-13 (ICL Growing Solutions, Tel Aviv-Yafo, Israel) 1200 µS cm^{-1} EC and pH 5.7-6.0. Each shelving unit was coupled with a 50 L nutrient solution reservoir, pump, and irrigation line with emitters for automatic irrigation. Pumps were on timers for scheduled irrigation, with the timing and duration of each irrigation event adjusted organically in response to crop growth stages and need. Each pot was top-down irrigated with emitters, and excess nutrient solution drained from the bottom of the pots to maintain substrate aeration and to prevent waterlogging. To support cucurbit vines throughout the growth period, vines were secured onto 3D-printed trellises to support the crop. The width and length of the trellis were designed to fit snugly in the 6-in pots (approximately 15 cm in diameter), and are stackable, with each trellis being approximately 23 cm in height. Trellises were stacked in response to the cucurbits as they advanced through the growth stages (Figure S1).

Microbiology Testing

Each sample was aseptically homogenized and plated onto Trypticase Soy Agar (TSA) and Inhibitory Mold Agar (IMA) plates for total aerobic and fungal detection. For *Escherichia coli* and *Staphylococcus aureus* screening, selective and differential Petrifilms were employed. If a *S. aureus*

Petrifilm showed growth, presence of *S. aureus* would be confirmed via DNase testing. Salmonella screening involved selective enrichment in Rappaport-Vassiliadis medium followed by isolation on Hektoen enteric agar. All procedures followed the FDA Bacteriological Analytical Manual (2023).