**Supplementary Table 1: Characteristics of Reviewed Studies (n = 40)**

|  |  |  |  |
| --- | --- | --- | --- |
| **Category** | **Subcategory** | **Number of Studies** | **Percentage (%)** |
| **Geographic Distribution** | China | 8 | 20% |
| USA | 6 | 15% |
| EU | 12 | 30% |
| Other | 14 | 35% |
| **Technology Focus** | IoT only | 18 | 45% |
| Blockchain only | 13 | 32.5% |
| AI/ML only | 9 | 22.5% |
| Full ECBT integration | 1 | 2.5% |
| **Implementation Stage** | Commercial deployment | 10 | 25% |
| Pilot projects | 24 | 60% |
| Controlled experiments | 6 | 15% |
| **Crop Types** | Leafy vegetables | 14 | 35% |
| Berries | 10 | 25% |
| Tree fruits | 8 | 20% |
| Other horticultural crops | 8 | 20% |
| **Key Performance Metrics** | Latency reduction | 15 | — |
| Cost savings | 12 | — |
| Quality improvement | 18 | — |
| Traceability accuracy | 22 | — |

**Supplementary Table 2: Quality Assessment Criteria and Scoring**

|  |  |  |
| --- | --- | --- |
| **Quality Domain** | **Assessment Criteria** | **Score** |
| Methodological Appropriateness | Clear research design aligned with objectives | 0–1 |
| Data Collection Rigor | Systematic data gathering with validated instruments | 0–1 |
| Analytical Completeness | Comprehensive analysis addressing research questions | 0–1 |
| Findings–Data Coherence | Results clearly derived from presented data | 0–1 |
| Reflexivity | Limitations acknowledged and biases addressed | 0–1 |
| **Total Score** | **Studies scoring ≥4/5 included** | **0–5** |