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**Assessing sustainability coherence in plant-based foods through THE Tech–Nutri–Eco framework**

*Evaluarea coerenței sustenabilității produselor alimentare pe bază de plante prin cadrul Tech–Nutri–Eco*

The growing transition toward sustainable food systems has accelerated the expansion of plant-based food products, commonly promoted as environmentally friendly and healthy alternatives. However, recent research highlights persistent tensions between technological processing intensity, nutritional quality, and environmental performance, leading to fragmented sustainability assessments. Addressing this challenge requires integrative analytical approaches capable of evaluating internal consistency across sustainability dimensions.

The aim of this study was to examine how technological, nutritional, and environmental dimensions are currently assessed and communicated in plant-based foods and to develop an integrative framework capable of identifying cross-dimensional incoherences. To this end, the study introduces the Tech–Nutri–Eco triadic conceptual framework together with the diagnostic indicator ICON (Integrated COherence iNdex). The research employed a critical narrative review methodology covering scientific literature published between 2015 and 2025 in major international databases. A thematic analysis was conducted to identify conceptual and methodological tensions among technological classification (NOVA), nutritional profiling (Nutri-Score), and environmental assessment schemes (Eco-Score/Product Environmental Footprint). To illustrate operational applicability, a proof-of-concept analysis was performed on an illustrative dataset of 45 plant-based products extracted from the Open Food Facts database. The findings reveal recurrent patterns of multidimensional incoherence, including the "eco–ultra-processing paradox," whereby highly processed products may simultaneously achieve favourable nutritional and environmental scores. Application of the ICON indicator enabled the identification of coherent and incoherent product profiles, demonstrating that strong performance in a single dimension may conceal structural trade-offs across sustainability axes.

Current sustainability assessments remain insufficient in the absence of an explicit multidimensional coherence criterion. The proposed Tech–Nutri–Eco framework and ICON indicator provide a conceptual and diagnostic tool supporting critical evaluation of sustainability claims and contributing to improved governance and policy interpretation within sustainable food systems.

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