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Ugly but Tasty? Assessing Italian Consumers' Acceptance of Fruit and Vegetable Suboptimal Products

Roberta Pietrangeli, Eleonora Sofia Rossi, Sara Sansoni and Clara Cicatiello

Department for Innovation in biological, agro-food and forest systems (DIBAF), University of Tuscia, via san Camillo de Lellis snc, 01100 Viterbo, Italy

Abstract

Previous studies indicate that consumers show a willingness to purchase suboptimal fruit and vegetable products, particularly when they are associated with a price discounts or sustainability claims (de Hooge et al., 2017, 2018; Aschemann-Witzel et al., 2020; Hartmann et al., 2021; Tait et al., 2024). However, the available evidence for Italy remains still limited. Suboptimal fruit and vegetable are perfectly healthy and nutritious products that don't comply with private quality standards for the fresh market, especially cosmetic standards, which may contribute to food losses (Porter et al., 2018). The aim of this paper is to investigate whether Italian consumers in Italy are ready to purchase suboptimal fruit and vegetable products and to determine whether their willingness to pay differs from the average market price. The methodology consists of two steps: first, a literature review conducted following the PRISMA methodology to analyse the current state of the art; second a survey is administered to consumers to measure willingness to pay for suboptimal products. The literature review were conducted in November 2025 using the following search string: "(TITLE-ABS-KEY("FOOD LOSS") OR TITLE-ABS-KEY("FOOD WASTE") AND TITLE-ABS-KEY(imperfect products) OR TITLE-ABS-KEY(suboptimal product))". The selection criteria were based on the research methodology used, type of crop and defects analysed. A total of 74 articles were identified, of which 54 were analysed after the screening process. Based on the literature review, a survey was designed to assess the consumers' willingness to purchase suboptimal products. Three types of defects were analysed -colour, shape, surface - and tested on four different products, including two vegetables (zucchini and cauliflower - the variety of Broccolo Romanesco) and two fruits (pear and strawberry). For each product, the average selling price in Italy in December 2025 was presented alongside an image of the "perfect" product, followed by images displaying one defect at a time. Respondents were then asked whether they would be willing to purchase the product and, if so, at what price. For each product, final questions asked participants to choose which of the three suboptimal products, if any, they would purchase at the average selling price. The images were generated using artificial intelligence. The survey also included additional questions on consumers' purchasing habits. The questionnaire is administered between January and March 2026. Currently, 352 answered are collected. First results show that, overall, shape defects are the most easily accepted by consumers: around 90% would buy misshapen cauliflower, 69% zucchini, 80% pears, and 56% strawberries. Colour defects have much lower acceptance: less than 50% of consumers would buy cauliflower and zucchini, while the rate for for pears and strawberry is around 80%. For surface defects, the rate is nearly 30% for cauliflower and pears, while higher than 55% for zucchini and strawberries.

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Keywords: suboptimal products, WTP, fruit and vegetable, Food waste, Imperfect foods, Consumer choice

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