






Abstract

# Enhancing Bioactive Compound Extraction from Pumpkins Using Accelerated Solvent Extraction <sup>†</sup>

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**Abstract:** Pumpkins (*Cucurbita* spp.) are a widely cultivated vegetable in traditional agricultural regions. A high abundance of bioactive ingredients like carotenoids and polyphenols contribute to their status as a functional food, offering diverse health benefits such as antibacterial, antitumor, anti-inflammatory, and antihypertensive properties. This research aimed to optimize the accelerated solvent extraction (ASE) of pumpkin powder to obtain an extract with the highest yield of carotenoids and polyphenols. The targeted compounds were quantified using spectrophotometric analysis during pressurized liquid extraction. Antioxidant activity, assessed by DPPH and ABTS assays, was also determined using a spectrophotometer. The optimization process employed an artificial neural network (ANN) approach, investigating extraction parameters such as temperature, extraction time, and number of cycles. The results revealed that the ASE should be performed at an elevated temperature, with reduced extraction time and an average of two cycles, to achieve an optimal extract with elevated carotenoid and polyphenol content as well as high antioxidant potential. Further characterization of the optimal extract will involve analyzing its chemical composition and bioactivity, while future studies should explore different solution types. These findings hold promising applications for the functional food industry.

**Keywords:** ASE optimization; pumpkin; carotenoids; polyphenols; antioxidant activity



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