



## ESSENTIAL OILS IMPACT ON ELDERBERRY JAM'S ANTIOXIDANT AND SENSORY PROFILE

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**Abstract:** The utilization of *Sambucus nigra* L. fruits, owing to their complex biochemical profile encompassing a high content of antioxidants and other biologically active substances, is experiencing a notable increase in the food industry, particularly in the context of advanced natural formulations. This study aimed to produce and characterize five distinct elderberry jam formulations: a control sample (EJ) and four experimental samples incorporating essential oils of lemon (EJL), grapefruit (EJG), orange (EJP), and tangerine (EJT). The characterization encompassed the determination of ascorbic acid content (titrimetric analysis), total polyphenol concentration (Folin-Ciocalteu assay), antiradical activity (2,2-diphenyl-1-picrylhydrazyl free radical scavenging assay), proximate composition, and sensory attributes (5-point hedonic scale). The results highlighted that, concerning vitamin C content, there were no significant differences between the control sample and those with essential oils. However, the addition of citrus essential oils resulted in important increases in total polyphenol content and antioxidant activity. Furthermore, the addition of essential oils led to a superior evaluation of the sensory attributes of the elderberry jam by the tasters, with the product containing grapefruit essential oil (EJG) being the most highly rated.

**Keywords:** elderberry, jam, essential oils, vitamin C, polyphenols, antioxidant activity

### • Results and discussions

Sample	Vitamin C (mg/100g)	Total Polyphenol Content (mg GAE/g)
EJ	18.65±0.06	166,88±1.38
EJL	18.58±0.16	195,47±1.44
EJP	18.62±0.08	178,35±1.21
EJG	18.59±0.14	238,28±1.37
EJT	18.48±0.11	162.16±1.23



Sample	Dilution	RSA (%)
EJ	1:100	59.80±0.23
EJL	1:100	68.43±0.18
EJP	1:100	61.01±0.28
EJG	1:100	86,32±0.33
EJT	1:100	59.88±0.22

### • Conclusions

Enhancing elderberry jam with citrus essential oils not only deepens its flavor profile but also significantly increases its polyphenol content and antioxidant capacity. Consequently, the incorporation of these oils is recommended to yield an elderberry preserve exhibiting enhanced organoleptic properties and superior health benefits compared to traditional formulations. Notably, among the citrus essential oils studied (lemon, orange, grapefruit, and tangerine), grapefruit essential oil proved to be the most impactful in improving both the antioxidant and sensory qualities of the final product.

### Sensory characteristics scores

