



VII_PP1_Effect of different heat treatments on antioxidative activity in pumpkin (*Cucurbita maxima*)

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Pumpkin (*Cucurbita maxima*) contains significant amounts of diverse phytochemicals, including polyphenols (flavonoids, tannins) and carotenoids. Some of these compounds are known antioxidants, capable of neutralizing harmful biological free radicals, thus protecting health of living organisms. However, the numerous food-processing technologies decrease the amounts of naturally occurring antioxidants, due to enzymatic and nonenzymatic oxidation processes. The aim of this research was to determine the influence of different heat treatments (cooking, baking in conventional and microwave oven) on the antioxidant activity of phytochemicals present in the pumpkin.

The antioxidant activity was quantified spectrophotometrically, at the specific wavelengths, utilizing standard colorimetric reactions. The total antioxidant capacity of the analyzed samples was determined by phosphomolybdate method using ascorbic acid as a standard [1]. Antioxidant activity was measured by the inhibition of lipid peroxidation (FTC) [2] and free radical scavenging (DPPH[•] [3], hydroxyl [4] and ABTS radical cation [5]) methods.

The highest total antioxidant capacity was found in a raw pumpkin sample (5.58±0.33 mg AAE/g), while the lowest value was found in a sample of pumpkin baked in conventional oven (2.88±0.32 mg AAE/g). Inhibition activity against lipid peroxidation (IC₅₀) was the highest in raw pumpkin (16.72±0.73 µg/ml), and the lowest one was in conventional baked pumpkin (8.49±0.31 µg/ml). Free radical scavenging activity measured by DPPH and hydroxyl radicals (IC₅₀) were the highest in raw sample (35.67±1.99 µg/ml) and (19.46±1.60 µg/ml), respectively, while the lowest values were in conventional baked pumpkin (15.68±1.32 µg/ml) and (9.69±2.01 µg/ml), respectively. Antioxidant activity measured by ABTS radical cation scavenging (IC₅₀) was the highest in raw sample (41.63±0.61 µg/ml) and the lowest value was found in a sample baked in conventional oven (21.32±0.45 µg/ml). The results showed that different heat treatments significantly affected on antioxidant activity, especially baking in conventional way, what makes it the least favorable process in this study.

References

1. Prieto, P. et al., *Analytical Biochemistry*, 1999, 269(2), 337-341.
2. Hsu, P.P. et al., *Cell*, 2008, 134(5), 703-707.
3. Takao, T. et al., *Bioscience, Biotechnology, and Biochemistry*, 1994, 58(10), 1780-1783.
4. Hinneburg, I. et al., *Food Chemistry*, 2006, 97(1), 122-129.
5. Re, R. et al., *Free Radical Biology and Medicine*, 1999, 26(9-10), 1231-1237

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