

The effect of common pre-treatments and cooking techniques on the antioxidant capacity of Chickpea (*Cicer arietinum*), Cowpea (*Vigna unguiculata*) and Green Gram (*Vigna radiata*)

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Legumes are rich in antioxidants which are beneficial in reducing the oxidative stress in human body. Antioxidants present in legumes could be affected by common pre-treatments and cooking techniques. Therefore the aim of this study was to compare the antioxidant capacity of chickpea (*Cicer arietinum*), cowpea (*Vigna unguiculata*) and green gram (*Vigna radiata*) after subjecting to combinations of pre-treatments (soaking and germination) and cooking techniques (cooking in a clay pot, aluminum pot, pressure cooker and microwave oven). The untreated legumes were used as the control. Antioxidant capacity (AC) was determined using 2, 2'-Azino-bis (3-ethylbenzothiazoline-6-sulfonic acid) assay. Values are expressed as μmol trolox-equivalent antioxidant capacity (TEAC) normalized to dry weight (DW). In green gram, microwave cooking of raw green gram resulted significantly higher ($p < 0.05$) AC ($2031.48 \pm 200.23 \mu\text{mol TEAC}/100\text{g}$) compared to control. In chickpea and cowpea, germination followed by aluminum pot cooking showed the highest AC over the other treatment (1756.70 ± 122.20 and $1403.82 \pm 74.67 \mu\text{mol TEAC}/100\text{g}$ respectively) which were significantly ($p < 0.05$) low compared to control. According to the results, germination followed by aluminum pot cooking could be recommended to preserve antioxidants in white chickpea. Raw, germinated and soaked cowpea subjected to different cooking techniques (except microwave cooking of soaked, germinated and raw cowpea, pressure cooking of soaked and aluminum pot cooking of raw cowpea) could be recommended to preserve antioxidants. In green gram, microwave cooking and clay pot cooking of raw green gram, germination and soaking followed by aluminum pot cooking could be recommended to preserve antioxidants.

Keywords: legumes, antioxidant capacity, pre-treatment, cooking techniques