



Protein extract and activity antioxidant of corn (*Zea mays*) and sorghum (*Sorghum bicolor* L. Moench) grains

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Brazil is a major producer of grains, such as sorghum and corn, which are used for export. Sorghum and corn grains have in its composition 9.5% and 9.8 protein, respectively. Proteins are the most abundant and most diverse functions in living systems molecules. Currently, food proteins are increasingly recognized as a source of beneficial bioactive peptides, and they are physiologically released during digestion. The aim of the work was to evaluate the protein extraction (four methods) and antioxidant activity of sorghum and corn grains. The proximal composition of grains was evaluated in relation to moisture, protein, lipids and ash contents, furthermore were quantified proteins concentration and antioxidant activity by FRAP method in the four extracts. The corn and sorghum grains were ground, homogenized (60 mesh) and stored at 5°C until analysis. The protein extraction utilized were: 1) dichloromethane/methanol; 2) NH_4HCO_3 (5mM, pH 8.0)/heat treatment; 3) water/ethanol/heat treatment; and 4) alkaline extraction and precipitation. The corn and sorghum presented, protein 6.62% and 9.87%, lipids 4.45% and 4.32%, moisture 8.87% and 8.23%, ash 0.96% and 1.15%, carbohydrates 79.01% and 76.41%, totalizing a caloric value of 382.9 and 384.1 Kcal g^{-1} , respectively. The 2 and 3 methods in corn grain presented highest protein content 133.16 and 142.24 $\mu\text{g g}^{-1}$, respectively. In sorghum grain, methods 1, 2 and 3 presented protein content between 173.59 – 223.63 $\mu\text{g g}^{-1}$. The antioxidant activity of protein extracts was between 0.90 – 9.73 μM of ferrous sulphate for corn and between 4.41 – 15.04 μM of ferrous sulphate for sorghum. The best results in the extraction using the method 3 for both grains could be due to the structure of proteins (zein and kafirins) which are soluble in alcoholic solutions and insoluble in water. In conclusion, method 3 - water/ethanol/heat treatment (corn: 142.24 $\mu\text{g g}^{-1}$ and sorghum: 223.63 $\mu\text{g g}^{-1}$) and method 3 (corn: 9.73 μM and sorghum: 15.04 μM) showed the best results for extracting protein and antioxidant activity, respectively. The protein extracts obtained have great potential as natural antioxidants.

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Keyword: FRAP method, bioactive peptides, proximal composition.