

Physicochemical Characteristics and Antioxidant Effects of Cooked-rice Added Foxtail Millet according to Cooking Method

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[Introduction]

Foxtail millet (*Setaria italica* Beauv.) is an annual grass grown for human food. It is the second-most widely planted species of millet, and the most important in East Asia. It has the longest history of cultivation among the millets, having been grown in India since antiquity. According to recent research, it was first domesticated in China around 6,000 BC. This study was carried out to analyze the antioxidant components and activities of cooked mixed grain rice-added foxtail millet with different addition rates and cooking methods.

[Materials and Methods]

The foxtail millet cultivars were grown at the National Institute of Crop Science, RDA, Miryang, South Korea during the 2015 cropping season. This study was carried out to analyze the antioxidant components and activities of cooked mixed grain rice-added foxtail millet with different addition rates (0, 5, 10, 15, and 20%) and cooking methods. The two foxtail millet varieties used in this study were non-waxy foxtail millet, 'Samdame', and waxy foxtail millet, 'Samdachal'. Cooked mixed grain rice-added foxtail millet was cooked by general and high pressure cooking methods with and without fermented alcohol.

[Results and Discussions]

Except for breakdown viscosity, pasting characteristics of foxtail millet were reduced with increasing amounts of foxtail millet. Water-binding capacity and swelling power significantly decreased with increasing amounts of foxtail millet, whereas water solubility index significantly increased. Total polyphenol and flavonoid contents increased with increasing amounts of foxtail millet. DPPH and ABTS radical scavenging activities also increased with increasing amounts of foxtail millet. Moreover, foxtail millet cooked by general cooking method with fermented alcohol showed higher antioxidant effect compared to other cooking methods. In this study, antioxidant components and activities of cooked mixed grain rice-added foxtail millet with different addition rates and cooking methods can be used as basic data for manufacturing processed products.

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