

Impact of phytic acid on nutrient bioaccessibility and antioxidant properties of dehusked rice

ABSTRACT

Whole grains consumption promotes health benefits, but demonstrates controversial impacts from phytic acid in meeting requirements of good health. Therefore, this study was aimed to determine the nutrient bioaccessibility and antioxidant properties of rice cultivars named BAdan[^] or BBario[^] and deduce the nutritional impact of phytic acid. Majority of the dehusked rice in the collection showed an acceptable level of in-vitro starch digestibility and in-vitro protein digestibility, but were poor in antioxidant properties and bioaccessibility of minerals (Ca, Fe and Zn). The drawbacks identified in the rice cultivars were due to relatively high phytic acid content (2420.6 ± 94.6 mg/100 g) and low phenolic content (152.39 ± 18.84 μ g GAE/g). The relationship between phytic acid content and mineral bioaccessibility was strongest in calcium ($r=0.60$), followed by iron ($r=0.40$) and zinc ($r=0.27$). Phytic acid content did not significantly correlate with in-vitro starch digestibility and in-vitro protein digestibility but showed a weak relationship with antioxidant properties. These suggest that phytic acid could significantly impair the mineral bioaccessibility of dehusked rice, and also act as an important antioxidant in nonpigmented rice. Bario rice cultivars offered dehusked rice with wide range of in-vitro digestibility of starch and protein, and also pigmented rice as a good source of antioxidants. However, there is a need to reduce phytic acid content in dehusked rice for improved mineral bioaccessibility among Bario rice cultivars.

Keyword: Phytic acid; Antinutrients; Antioxidants; Bario rice; Dehusked rice; Sarawak