

Effect of simulated *in vitro* gastrointestinal digestion on phenolic compounds and antioxidant capacity of a sorghum-cowpea composite porridge

Oluyemisi E. Adedokun and Gyebi Duodu
University of Pretoria, South Africa

Sorghum (*Sorghum bicolor* (L.) Moench, and cowpea (*Vigna unguiculata*) have a variety of phenolic compounds that have been shown to have antioxidant activity. The potential health benefit of these antioxidants depends on how they are absorbed and utilized in the body. This study was to determine the effect of simulated gastrointestinal digestion on phenolic compounds and antioxidant capacity of a sorghum-cowpea composite porridge.

Porridge was prepared from a composite flour of sorghum (Orbit variety, white non-tannin) and cowpea (Bechuana white variety, light brown) [sorghum/cowpea (70:30)] and subjected to *in vitro* digestion by treatment with gastric juice (gastric phase digest) and porcine pancreatin and bile extract (intestinal digest). Flours, porridge and digested porridge were analysed for total phenolics, total flavonoids, ABTS-radical scavenging capacity and specific phenolic acids and flavonoids. Total phenolics and flavonoid content of the gastric (86.52 µg CE/g; 8.79 µg CE/g) and intestinal phase digest (514.06 µg CE/g; 52.73 µg CE/g) were lower than the composite flour (2720.05 µg CE/g; 220.91 µg CE/g) and its porridge (908.41 µg CE/g; 129.58 µg CE/g). The ABTS-radical scavenging capacity of all samples ranged from 5.24 - 507.34 µg TE/g. The gastric phase and intestinal phase digests maintained 1.57% and 28.91% of the radical scavenging capacity of the porridge. Catechin and gallic acid were lower in the intestinal digest (1020.90 µg/g; 83.87 µg/g) than the undigested porridge (3122.77 µg/g; 144.55 µg/g). Sorghum-cowpea composite porridge contains phenolic antioxidants even after gastric and intestinal digestion with potential to significantly impact human health.